RAILROAD GAZETTE

FRIDAY, MARCH 27.

Report of the Baltimore & Ohio Employes' Relief Association.

The fourth annual report of Dr. S. R. Barr, Secretary of this Association, for the year ending Sept. 30 last, states that during the year the liabilities reported Sept. 30, 1883, as outstanding, and since presented, have been liquidated, and so much of the compounded interest derived from the company's donation of $100,000 as was not needed to fulfill the original provisions of the Relief features have, under the terms of the endowment, been credited to the Pension feature.

The Baltimore & Ohio Railroad Co. having made large advances to the Association on account of such operating expenses as it did not undertake to bear, by resolution of its board of directors, Oct. 1, 1884, the company donated the same to the pension fund, leaving the net balance $51,702.

During the past fiscal year the receipts and disbursements have been as follows:

Net balance of 1882-83		$48,784
Premiums from members	$274,100	
Interest on B. & O. Co. fund	6,000	
" cash balances	6,802	
		286,902
Total receipts		$335,686
Benefits to members	$204,218	
Physicians' bills, etc.	16,249	
		220,467
Balance Sept. 30, 1884		$115,219
Add uncollected assets		2,237
Total		$117,456
Outstanding liabilities	$60,472	
Reserve fund	24,019	
		84,491
Net balance from year's operations		$32,965

This net balance from the year's operations is regarded by the Actuary as sufficient to justify your management in maintaining the 100 per cent. increase on the natural death allowance during the fiscal year ending Sept. 30, 1885, in favor of all who were members prior to Oct. 1, 1884.

The benefits paid for the year and for the 4½ years from the starting of the association to Sept. 30 last, were:

	1883-84 No.	1883-84 Amount.	Total. No	Total. Amount
Deaths from accident	53	$51,500	201	$206,525
Deaths from other causes	109	37,414	383	113,114
Disabilities from injuries received in discharge of duty	2,810	35,489	9,093	114,712
Surgical expenses	1,807	11,462	5,975	40,958
Disability from other causes	5,136	76,193	19,039	275,498
Total	9,915	$212,058	34,691	$750,807

The average payment on each accidental death was $1,027.

The total number of policies issued since May 1, 1880, was 46,322, of which number 15,390 were written during the past fiscal year, an increase as compared with the previous year of 7,344. The present active membership is 17,707—an increase of 1,370 over the previous year.

The appointment of five assistant medical examiners to examine all applicants for admission to the company's service has enabled the management to give special attention to the sanitary condition of the surroundings and those of the traveler over the Baltimore & Ohio Railroad system. This work is regarded as one of great importance and will be continued, and, when practicable, extended. The officers of the Association whose duty it is to inspect all of the premises of the company, have been active and efficient, and their efforts to prevent disease by improving the surroundings of members are fully appreciated and encouraged by the management of the Baltimore & Ohio Co.

The distribution of medicines of the nature heretofore furnished has been continued with marked and gratifying results during the past year, and it is further proposed to extend this feature by the addition of appliances, etc., for use in cases of accident.

At a meeting of the Committee of Management held April 22, 1884, resolutions were adopted requiring all persons thereafter becoming members of the association to submit to a medical examination, The results already obtained during the short period this requirement has been enforced show a rejection of 7½ per cent. of those applying for admission, who would otherwise have become members and caused undoubted loss to the fund, fully justify the expense incurred, which is jointly borne by the association and the Baltimore & Ohio Co., and manifest the wisdom of this regulation, which will undoubtedly greatly strengthen the relief fund.

PENSION FEATURE.

In its prospectus inaugurating the Association in May, 1880, the Baltimore & Ohio Railroad Co. set forth its intention to provide for its employés in sickness, accident, death and old age, in aid of which it gave the Association an endowment of $100,000, and undertook to bear certain of its expenses. Your Association being the first of its character and scope ever inaugurated in this country, it was not deemed desirable to inaugurate too many features at first, and therefore the establishment of the Pension feature was postponed as being the least pressing of those proposed.

During the past year the Baltimore & Ohio Railroad Co. and the Association jointly announced the establishment of the Pension feature, and, as only a small part of the interest heretofore earned on the company's endowment had been needed to make good the company's promise on behalf of the Relief features, the remainder of the sum thus earned, together with other large advances made by the company for the Association's personal operating expenses were appropriated by the Baltimore & Ohio Railroad Co. to the Pension feature, as an additional donation to that feature. The Baltimore & Ohio Railroad Co. has, in addition, by resolution of its board of directors, undertaken to appropriate annually to the Pension feature the sum of $25,000. On its side your Committee of Management have undertaken to appropriate to the Pension feature annually so much of the interest earned on the original endowment of $100,000 as may not be needed to make the Relief features effective—thus fully carrying out the original intention and promise of the company in regard to these several features. No portion of the contributions of members to the Relief features has been, nor will any portion be diverted to the Pension feature.

The provisions of this feature were adopted July 22, 1884, to become operative on Oct. 1, 1884; the rules and regulations governing it are given in full in the report. It is intended for the relief of those members whose total disability continues after the year during which they are entitled to allowance from the Relief fund; also for employés retired on account of old age after 10 or more years' service with the company.

The adoption of this feature is welcomed as a most desirable addition to your association. The Relief features prevent suffering during temporary disablements and the Pension feature now provides for members after they have become unfit to work by reason of age, infirmity or permanent disability.

SAVINGS FUND AND BUILDING FEATURES.

The only change in these features has been the adoption of a rule extending the privilege of making deposits to all employés of the road, whether members of the association or not.

The assets and liabilities of the fund were:

Loans		$82,546
Furniture, etc.		5,057
Advanced by B. & O. Co		6,586
Cash on hand		65,546
Total		$160,335
Due 535 depositors	$148,065	
" borrowers (unexpended loans)	1,340	
" B. & O. R R Co	10,758	
" B & O. Relief Association	182	
		160,335

There have been 160 borrowers, the loans amounting to $99,869, of which $17,323 have been returned, leaving $82,546 out.

Prof. McCay, Actuary, says in his report:

"The operations of the Savings Bank during the past twelve months have been very satisfactory. We have doubled our deposits and our interest receipts increased the average net accumulation from $7,300 a month to $7,800, and maintained the steady increase even in those months of panic and disaster of last summer when the whole banking system of the country was so overwhelmed with losses and withdrawal of deposits that nearly every national bank in the country incurred the legal forfeiture of their charters by being unable to show a balance on hand equal to the lawful reserve, and while many savings banks and national banks were compelled to suspend.

"Our debt during the year has indeed increased, but that was to be expected during the infancy of the institution, when the interest gains were not anticipated to be sufficient to meet the necessary expenditures of book-keeping and salaries.

"The prospects of the ensuing year are very fair. It is confidently predicted that we will not only stop all increase of our debt, but largely reduce the present balance against us so that in the fourth year of our existence we may look forward to being free from debt and with ample means to meet our obligations without the guarantee of the Baltimore & Ohio Railroad Co.

"The loan and building business of our Association has been completely successful. Every loan has been carefully secured by the pledge of real estate worth one-third more than the loan, the interest on every indebtedness has been paid every month and not a single borrower is behind in the payment of the monthly reduction in loan required by our by-laws.

"The property mortgaged is secured in one of the strongest and most prosperous fire insurance companies, and all danger of loss by death of the owner whose daily toil secures the payment of interest and principal of the amount borrowed, is prevented by a life insurance policy transferred to our Association which would fully liquidate the debt on his homestead and relieve us from any contest with the widow and children of the deceased borrower.

"Our future prospects were never brighter than they are at the present time."

The Association has made arrangements to buy at wholesale materials for members desiring to build houses, giving them the benefit of lower prices and a careful inspection.

The report closes with appropriate tributes to the late John W. Garrett; also to the late Wm. Franklin, one of the first incorporators of the Association.

The Baltimore & Ohio Employes' Circulating Library.

The following general order was issued March 2, by Robert Garrett, President of the Baltimore & Ohio Railroad Co.:

The inauguration of a Free Circulating Library for the employés and the families of employés of the Baltimore & Ohio Railroad Co. is announced.

The operations of the Library will be conducted by a Librarian, acting under the general supervision and control of a library committee, composed of two members of the board of directors of the Technological School; two members of the Committee of Management of the Relief Association, and a representative of the Baltimore & Ohio Co. appointed by the President. Appointments of members of this Committee shall be made annually and shall be effective Oct. 1 of each year. The principal instructor of the Technological School and the Secretary of the Relief Association shall be *ex-officio* members of this Committee.

Rules for the government of the Library will be made and promulgated by the library committee.

Dr. W. T. Barnard, Assistant to President, is named, in behalf of this company, as a member of the library committee.

Mr. A. M. Irving is hereby appointed Librarian.

The General Manager will see that proper support and cooperation is given this institution by all departments, as being part of a consistent plan for the higher education of those employed by this company.

The following rules have been prepared for the government of this library and are now in force:

1. The headquarters of the Library will be at the rooms of the Technological School, Mt. Clare, Baltimore, Md.

2. Its mission being to exert an elevating and educating influence on the employés of the service, and particularly their children, it will supply only current periodicals, standard works on the sciences, general literature, poetry, historical, text and other books of practical utility to engineers, mechanics, firemen, apprentices and other railroad employés, and such as are especially adapted to educating and elevating the character of the young. Whatever is purely sensational or immoral in tendency will be rigidly excluded from its shelves, and its management will always endeavor to discourage the use of literature from which unhealthy and unreal ideas of life might be drawn.

3. The Librarian will also undertake to purchase for—and to forward to—employés, stationery, school, text and other books at cost price; giving them the benefit of such discounts as can be obtained on large orders.

4. Library committees will be appointed at divisional and principal stations, and at other points agents will be designated through whom those desiring to utilize the Library can obtain and return its literature. Lists of such committees and agents will be published from time to time.

5. Catalogues of the Library and blank requisitions for books can be found in the offices of agents at first and second class stations, at the offices of the master mechanics, supervisors of trains and road, and in possession of every member lof ibrary committees.

Additions to the Library will be promptly catalogued.

6. Any employé desiring to personally possess a catalogue will be furnished with one, and also with a number of blank requisitions, upon sending to the Librarian the sum of 25 cents to repay the cost of the same.

7. Books will be classified under two heads: the first class comprising such works as, from their rarity, value or extent, may not be withdrawn from the Library rooms, except when required by Instructors of the Technological School, or by employés who have obtained the written approval of the Chairman or three members of the library committee, to take them from the Library at stated periods. This class shall include all unbound periodicals and books of reference.

The second class shall embrace all books intended for circulation.

8. Any employé of the company, on furnishing the Librarian with his or her name, occupation, department, and indorsement of his or her immediate superior official, or other acceptable credential of responsibility, may draw books from the Library. Presentation of certificate of membership in the Relief Association, and identification, will be accepted as sufficient credentials. Members of the households of employés may exercise the same privileges as employés themselves, and upon the same conditions; but those unknown to the Librarian or library committees to whom they apply for library privileges must be fully identified by responsible persons. Library committees, agents and others intrusted with the distribution of literature, etc., are prohibited from delivering the same to any other person than those to whom addressed, or to some known member of his or her family, and will be held responsible for the wrong delivery of books.

9. Requisitions for books will be made on cards bearing on the reverse side the address of the Librarian, which must be countersigned by the agent or library committee to whom the book is to be sent, and which can be forwarded by train service as other railroad communications—the books called for being issued and returned through the same channel, in the order set down on the list. Requisitions will be returned by the Librarian to the library committee, agents or other persons distributing books, to be held until the books are collected; when each borrower's requisition will be returned to him or her. Possession of the requisition by the borrower will relieve him or her of all responsibility in regard to the books represented by that requisition; while its being in custody of the library committee or agent will, in case of loss, be considered proof that the borrower has not returned the book.

10. No book will be taken or sent out from the Library until its title and the name of the borrower shall have been registered by the Librarian.

11. Account will be opened with each employé or member of his or her family using the library, and while every care will be exercised in issuing and collecting books, they will be charged to those calling for them as soon as issued, and such charges will be cancelled only when the books are returned to the Library. No employé shall be permitted to take out more than one book (or two volumes of one work) at a time, without written permission, signed by the Chairman or three members of the library committee.

12. Books must not be kept beyond two weeks (except educational works, which may be retained three weeks), unless the requisition be renewed and possession acknowledged at the end of each bi-weekly period, dating from the day the work was issued from the library. The loan of a book will be renewed but once, if there are other applicants for it. A margin of three days will be allowed to cover time consumed in transmittal. No books, except technical works, will be allowed to remain in the possession of an employé beyond three months. Books returned will not be reissued until they have been examined and replaced upon the shelves.

13. A fine of one cent will be imposed for each day books are retained beyond the period within which they should be returned, or requisitions renewed under this rule.

14. No borrower shall lend a book to any other person than those belonging to his or her household. They are expected to use books with care and to keep them clean and neat.

15. While no fine is imposed upon borrowers for the loss of books, those found guilty of wilfully losing, mutilating or defacing the works, pamphlets or other property belonging to the library will be debarred from its privileges until the lost books shall be replaced or paid for, or full reparation made for the damage sustained.

16. To each package of books sent to the library on requisition, a distinctly written label will be securely attached, addressed to the library committee or other person charged with the delivery of the books therein contained. Each package will be serially numbered. The Libraian shall enter in a receipt book the serial number, date of transmission and address on each package, and the baggage-master, agent or other authorized person to whom such packages are delivered for transmission will receipt therein for each separate package, which will be invoiced and otherwise treated as the Baltimore & Ohio Co.'s property in transit.

17. Each library committee or person charged with the collection of books will, in returning them, pursue precisely the same course as that taken by the Librarian in distributing books—wrapping them in strong paper, with the Librarian's address prominent thereon.

18. The transportation of books from or to the Library shall not be at the risk of the person sending or receiving them, when forwarded through the company's officials charged with care of its train mails, or other like property, and receipt produced therefor.

19. The value of any Library property retained by an employé (or member of his household) leaving the service of the company will be deducted from his wages.

SPECIAL RULES FOR READING ROOM.

20. The Library will be open for members daily, excepting Sunday, from 9 a. m. to 3 p. m., and from 7 p. m. to 10 p. m. If otherwise ordered, notice will be duly given.

21. Employés calling for temporary use (in the Reading Room) of works contained in the Library cases must make their requests on the usual requisitions; no one but the Librarian or his assistant being at liberty to take any book or pamphlet from the cases.

22. No visitor will be allowed to withdraw any book or other property from the Library room, except upon receiving the same from the Librarian, upon making the usual requisition.

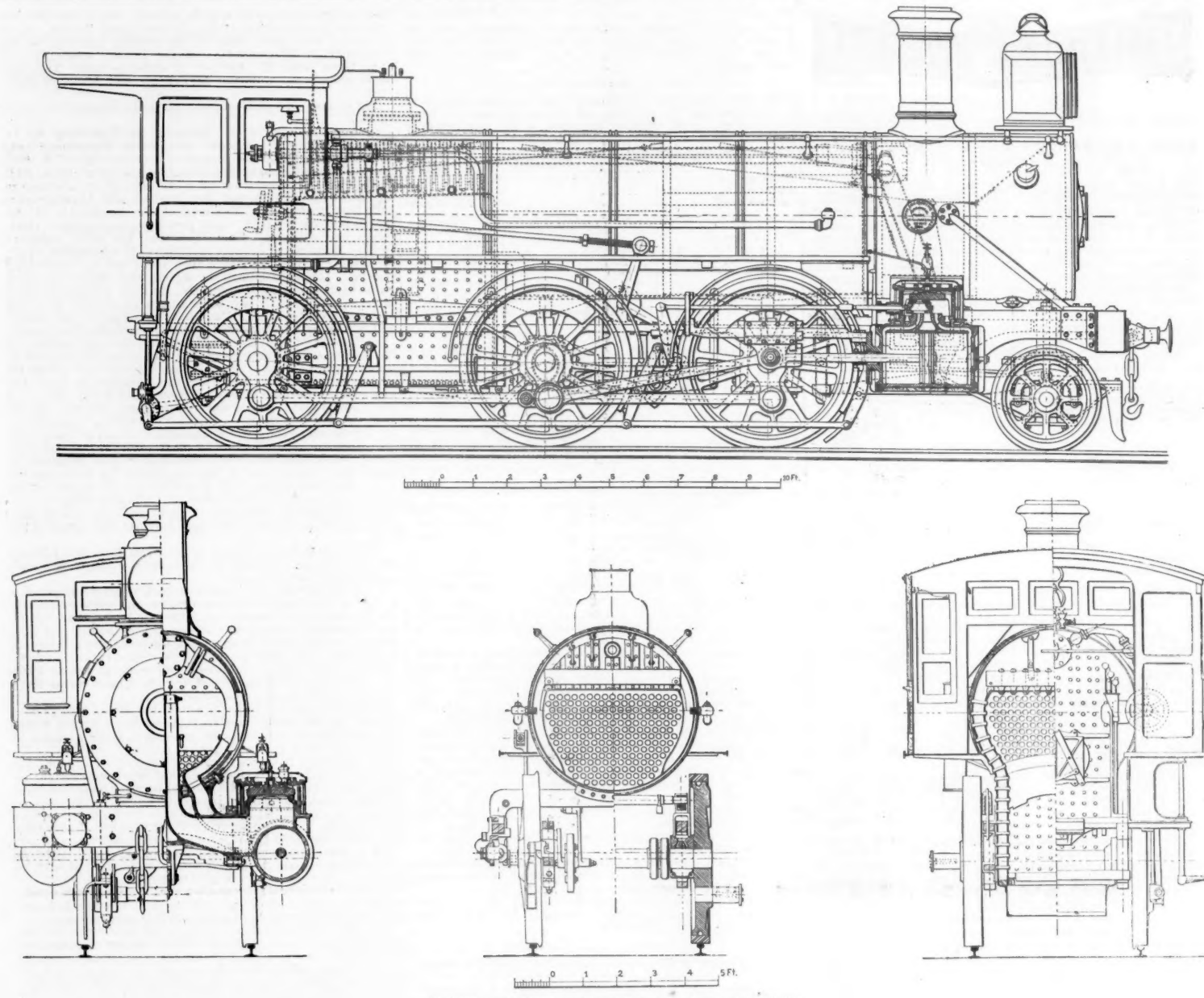
23. Visitors using the reading room must behave in an orderly and quiet manner. Conversation in a low tone only will be permitted there.

24. The Librarian shall, at all times, have and exercise the right to call for the immediate return of books belonging to the Library for the purpose of inspection or taking stock; and in his discretion, may require a deposit to cover the risk of loaning books exceeding $3 in value.

25. The taking or receiving of books from the Library will be considered as an acknowledgment of the binding force of the foregoing rules, and of all others which may, from time to time, be formulated and published by the library committee, in the interest of, or for the further protection of the Library.

26. It is made the duty of the Librarian to strictly enforce the rules promulgated for the government of the Library, and to report to the General Manager of the Baltimore & Ohio Railroad Co. any dereliction of duty in connection with the Library that, after proper investigation, shall be proven against any officer, agent or employé of the railroad company.

27. Any person, whether an employé of the company or not, may become an *Honorary Member* of the *Library* by the annual payment of $10 into its general fund, or by one payment of $100 into said fund. Honorary members shall



MOGUL ENGINE, NEW SOUTH WALES RAILWAYS.

Built by the BALDWIN LOCOMOTIVE WORKS, *Philadelphia, Pa.*

have the use of the Library on the above terms. Their names shall be annually published.

RULES OF THE LIBRARY COMMITTEE.

The Library Committee shall meet on the first Wednesday of each month for the transaction of business. Its fiscal year shall end Sept. 30, and its annual meetings shall be held on the first Wednesday of October of each year. It shall also be convened in special session, upon notice from the Secretary at the request, in writing, of three members of the committee.

A majority of the committee shall constitute a quorum.

It shall, at each annual meeting, elect a chairman from among its members, who shall preside over all its deliberations and perform such executive duties as may, from time to time, be delegated to him by the committee.

The Librarian shall act as the Secretary of the committee, performing the usual duties pertaining to that office.

All funds appropriated for, or donated to, the Library, shall be deposited in the Baltimore & Ohio Employés' Savings Fund, to the credit of the Chairman of the Library Committee.

No expenditure shall be made, or expense incurred on behalf of the Library, save with his written approval, and then only when there are Library funds in the Saving Fund of the Relief Association sufficient to defray the same. In no manner shall the income of the Library be anticipated, nor shall any purchase of books be made, save with the previous approval of a majority of the committee, of the works it is proposed to acquire. The Chairman shall audit the accounts of the Library, submitting to the committee, in monthly session, statements of all financial transactions relating thereto. Each member of the committee shall, at monthly and called meetings, and at other convenient times, have access to the records and accounts of the Library.

No person shall be entitled to receive any compensation or salary by reason of his service on the Library Committee.

None of the foregoing rules, nor the regulations governing the practice of the Library, shall be altered, modified, or repealed, nor shall any new rule be made, except at a general meeting of the Library Committee, upon one month's notice given at the preceding regular meeting of the committee.

Mogul for New South Wales Railways.

The accompanying illustrations represent an engine lately built by the Baldwin Locomotive Works for the Government of New South Wales. As will be seen, it presents several peculiarities not generally found in locomotive practice either here or in Europe, and we must therefore regard the engine as an example of Australasian design. Though constructed in this country, the specifications were prepared by Mr. Thomas Middleton, Locomotive Overseer, New South Wales Government Railways, Sydney.

It will be noticed that the connecting-rod has bushes at both ends, a mode of construction rarely adopted. Whil the simplicity of bushed ends makes them well adapted for coupling-rods, where a slack fit is not objectionable, it is very generally held that the slightest lost motion in a connecting-rod bearing is very detrimental to the engine, and tends to loosen the piston-rod in the cross-head and piston-head. The large size of the main crank-pins, 5½ in. × 5 in., will no doubt render the amount of wear extremely small, and possibly justify the adoption of a bushed end. The omission of keys, straps, bolts, etc., lessens the chances of failure. This large bearing surface is probably obtained at a smaller cost than the usual size of pin and rod end, giving less bearing surface. But not even the most ample bearing surface is a positive insurance against wear. A momentary neglect in oiling, or a little grit, will soon cut a brass bearing, and as a bush cannot be reduced in size, it must be thrown away if a tight fit is to be maintained.

We give below a table showing the relative areas of the crank-pins and pistons of some leading types of heavy freight engines described and illustrated in the *Railroad Gazette* during the last few years. The area of the crank-pin for the purpose of comparison is taken as the product of the length and diameter multiplied together. Taking the ratio of this product to the area of the piston as unity in the Australian engine, it will be seen that with the exception of the first engine on the list, all the engines have smaller crank-pins in proportion to their cylinders. As the first engine has inside cylinders, the proportions of the crank-pin are fixed by considerations as to the strength of the cranked axle rather than by any desire to give great bearing surface.

Designer.	Class.	Diam. cyl. in.	Diam. and length crank-pin. in	Area crank-pin. D × L.	Relative area crank-pin and piston.
Gt. East. Ry	Six-coupled	17½	7 × 4	28	1.074
New S. Wales	Mogul	18	5½ × 5	27.5	1.000
Gt. East. Ry	Mogul	19	5 × 5	25	0.809
Baldwin	Conso'l	20	5¼ × 5¼	27 6	0 809
Brooks	Ten-wheel	19	4¾ × 4¾	22.6	0.739
Brooks	Mogul	18	4⅜ × 4⅜	19.1	0.692
Lehigh V	Twelve-w	20	4⅝ × 4⅝	22.7	0.665
Cen. Pacific	Twelve-w	19	4¼ × 4	18	0 587

It will be noticed that the crank-pins are bored out, and lubrication is effected from within.

Screw reversing gear of a simple pattern is used, actuated by a hand wheel in the cab. The pin in the end of the reversing arm is made of large size and tapped for a screw thread, which is cut on the end of the reach rod. The latter, of course, revolves as the hand wheel in the cab is turned. Two washers, one at each end of the screwed part of the reach rod, act as stops to prevent the gear being thrown too far forward or back.

While a screw gear is somewhat slow in switching, it is very convenient in running over a line with changing grades. The cut-off can be altered without touching the throttle, and consequently without jerking the train and fracturing couplings. As the point of cut-off can be regulated to a nicety, it also encourages engineers to run their engine with the throttle wide open, varying the power only by altering the degree of expansion. This is, of course, conducive to economy.

Among other points in the specification attention may be drawn to the following:

Slide-valves.—Delancey's patent balanced slide-valves.

Westinghouse automatic brake, with driver brake acting on all six driving wheels, and all brake-shoes acting on front of their respective driving-wheels.

Boiler, without dome, steam being drawn from a copper dry-pipe extending entire length of boiler, and perforated on upper side for a distance of 8 ft. at the centre. Steam for cylinders is taken from front of this dry-pipe, while at the back it terminates in a brass steam-box, to which are attached all the cab steam-pipes, thus reducing to a minimum perforations of boiler with steam-pipe connections.

Small dome on boiler, carrying whistle and safety valve.

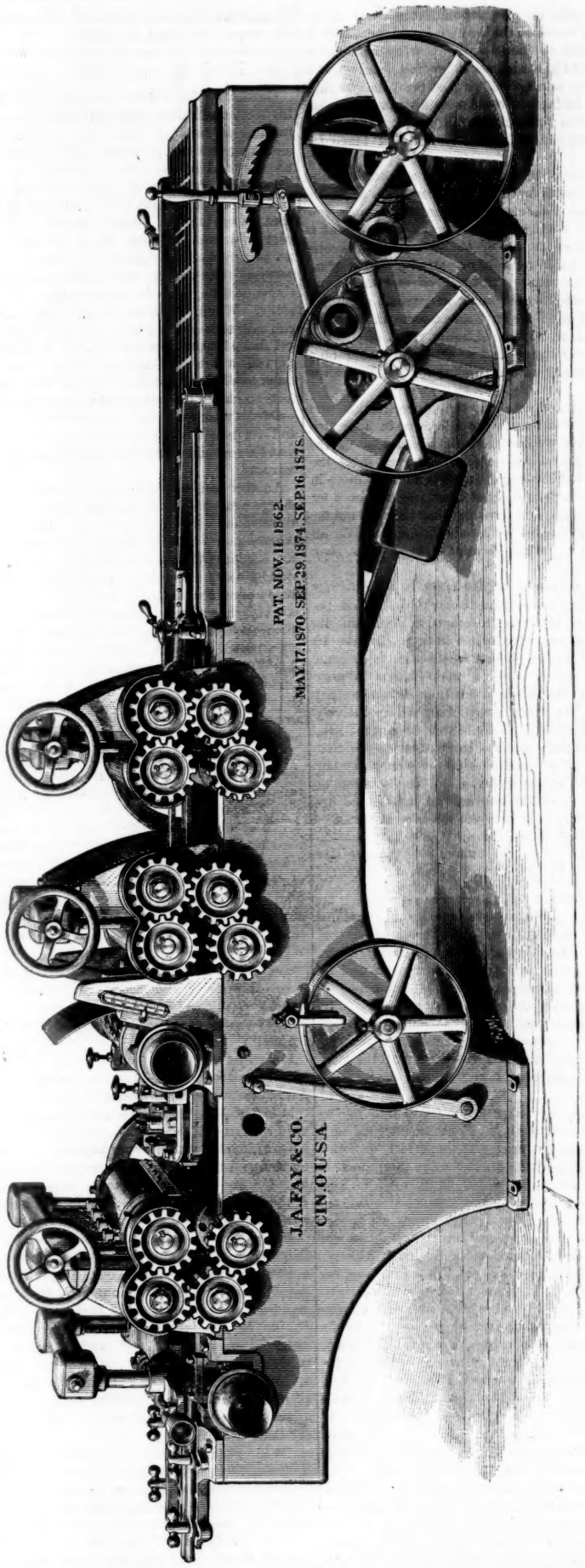
No bell. No pilot. Wheel guards forward of leading engine truck wheels.

Tank, wedge-shaped, 3,600 gallons capacity, carrying coal on inclined top of tank.

Extended smoke-box, brick arch, and straight stack.

Before shipment a trial was made of one of these locomotives on the Philadelphia & Reading Railroad, with especial reference to its ability to carry its water without lifting, and make an abundance of dry steam under adverse circumstances. The success of this test is best shown by the following extract from the report of the engineer who conducted the tests on behalf of the builders:

He says: "Wednesday morning, Sept. 17, 1884, I hauled 72 empty cars, as above, from Port Richmond to Nicetown. The pressure was maintained at 130 lbs. and the steam was cut off at 16 in. I found no trouble in working the injectors at this pressure and with the throttle wide open. On a second trip I hauled 102 cars, average weight six tons each, over the same line, cutting off at 16 in., and with both the injectors on at the same time against 130 lbs. pressure, and with the throttle wide open. The injectors worked as well as could be desired under all conditions, and the pressure was readily



DOUBLE PLANING AND MATCHING MACHINE.

Made by J. A. Fay & Co., Cincinnati, O., and Exhibited at the New Orleans Exposition.

maintained. With this train I made a speed of 20 miles per hour over the maximum grade and reverse curve above mentioned. and also stopped and started with ease on the maximum grade, and also on the grade and curve combined. I believe I could have hauled 150 cars under these conditions. The engine made perfectly dry steam in abundance, and showed no tendency whatever to lift the water. The screw reversing gear worked nicely, and could be operated easily with one hand with full pressure of steam on."

The maximum grade and shortest curve occurring in combination on this part of the line are: grade, 32.6 ft. per mile; curve, 1,700 ft. radius.

Weight and General Dimensions.

Gauge of road	4 ft. 8½ in.
Total weight of locomotive in working order, including two men	96,000 lbs.
Total weight on driving-wheels	79,000 lbs.
Total wheel-base	23 ft. 2 in.
Distance between centres of front and back driving-wheels	15 ft. 0 in.
Distance from centre of main driving-wheels to centre of cylinder	11 ft. 2 in.
Length of main connecting-rod from centre to centre of journals	6 ft. 7 in.
Transverse distance from the centre of one cylinder to the centre of the other	6 ft. 10 in.

Cylinders, Valves, etc.

Diameter of cylinders and stroke of piston	18 in. × 26 in.
Horizontal thickness of piston over piston-head and follower plate	4¾ in.
Kind of piston-packing	Steam packing.
Diameter of piston-rod	3 in.
Size of steam-ports	16 in. × 1¼ in.
Size of exhaust-ports	16 in. × 2½ in.
Greatest travel of slide-valves	5½ in.
Outside lap of slide-valves	⅞ in.
Inside lap of slide-valves	⅛ in.
Lead of slide-valves in full stroke	None.
Sectional area of opening in each steam-pipe connected with cylinders	15.9 sq. in.

Wheels, etc.

Diameter of driving wheels outside of tires	60½ in.
Diameter of truck-wheels	36½ in.
Size of main driving-axle journal, diameter and length	7 in. × 8 in.
Size of other driving-axle journals, diameter and length	7 in. × 8 in.
Size of truck-axle journals, diameter and length	5 in. × 8 in.
Size of main crank-pin journals, diameter and length	5½ in. × 5 in.
Size of coupling-rod journals, diameter and length	5½ in. × 4½ in. middle. 4½ in. × 3 in. F. & B.
Length of driving-springs, measured from centre to centre of hangers	3 ft. 2 in.

Boiler.

Description of boiler	Straight top.
Inside diameter of smallest boiler ring	55 in.
Material of barrel of boiler, best Pennsylvania cold-blast charcoal iron.	
Thickness of plates in barrel of boiler	¼ in.
Kind of horizontal seams	Lap seams, double riveted.
Kind of circumferential seams	Lap seams, single riveted.
Material of tubes	Steel.
Number of tubes	209
Diameter of tubes outside	2 in.
Distance between centres of tubes	2⅝.
Length of tubes over tube-plates	10 ft. 10¾ in.
Length of fire-box inside	71½ in.
Width of fire-box inside	34 in.
Depth of fire-box from under-side of crown-plate to bottom of mud ring	F 68½ in. B 66¼ in.
Water spaces, sides, back and front of fire-box	3 in., 3 in. and 4 in.
Material of outside shell of fire-box	iron.
Thickness of plates of outside shell of fire-box	⅜ in.
Material of inside fire-box	copper.
Thickness of plates in sides, back end and crown of fire-box	½ in.
Material of fire-box tube-plate	copper.
Material of smoke-box tube-plate	iron.
Thickness of front and back tube-plate	F ½ in., B ½ in. and ¾ in.
Crown-plate stayed with	crown-bars.
Maximum working steam pressure per square inch	150 lbs.
Kind of grate	rocking.
Width of opening between bars	¾ in.
Width of bars	⅞ in.
Grate surface	17 sq. ft.
Heating surface in fire-box	123 sq. ft.
Heating surface of the inside of tubes	1,066 sq. ft.
Total heating surface	1,189 sq. ft.
Kind of blast nozzle, single or double	double high.
Diameter of blast nozzle, three sizes furnished	3 in., 3¼ in., 3½ in.
Smallest inside diameter of chimney	18 in.
Height from top of rails to top of chimney	13 ft. 1 in.

Tender or Tank.

Weight of tender, empty	31,500 lbs.
Weight of tender, with coal and water full	72,700 lbs.
Number of wheels under tender	8.
Diameter of tender wheels	36 in.
Size of journals of tender axles, diameter and length	4 in. × 7 in.
Total wheel-base of tender	14 ft. 6 in.
Distance from centre to centre of tender trucks	10 ft. 0 in.
Water capacity of tank (in gallons of 231 cubic inches)	3,600 gals.
Coal capacity of tender or fuel-bin	10,000 lbs.

Engine and Tender.

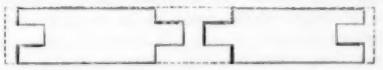
Total wheel-base of engine and tender	46 ft 2½ in.
Total length of engine and tender over all	54 ft 0 in

Double Planing and Matching Machine.

The accompanying illustration represents a fine wood-working machine just brought out by Messrs. J. A. Fay & Co., of Cincinnati, and exhibited by them in the Machinery Hall of the New Orleans Exposition.

The principal peculiarity of this machine is that it will plane, tongue, groove, and stick a bead on two boards at once, dividing one sawn plank into two tongued and grooved boards at one pass through the machine. This, of course, saves a great deal of time in preparing narrow ceiling or boarding, as it takes no more time to prepare two boards, each 4 in. wide, than one 9 in. wide on the ordinary method. The mode of operating the machine may be briefly described as follows:

The single board is passed through the machine, and placed top and bottom in the usual manner. The outer sides are grooved by cutters revolving on vertical axes. Two similar cutters on horizontal axes, one above and one below the board, then cut the tongues along the middle of the board



and split it in two, making two tongued and grooved boards. The accompanying wood-cut shows in dotted lines the original board, the two matched boards being shown in dotted lines.

By moving the lever in front, the whole matching works, including the arbor and heads, can almost instantly be dropped down below the line of the bed-plate when the machine is wanted for wide surfacing. The machine is thus at once converted into a wide surfacer, and can be changed back into a floorer in one minute's time.

The machine illustrated is of a medium size, and has been specially designed for the use of car-builders and others requiring large quantities of matched ceiling. The machine has a capacity for planing, on both sides only, any piece up to 24 in. wide and 6 in. thick, and will tongue and groove one board up to 16 in. wide, or, as previously explained, it will turn out two tongued and grooved boards at one operation. We understand that this machine has a capacity of about 40,000 ft. per day.

The upper and lower cutter heads are made from solid steel or wrought iron, slotted and lipped on all four sides for working cross-grained material. The shafts are made of the best cast steel, and forced into the heads by hydraulic pressure, and have driving pulleys upon each end. The journals are large, with long bearings, finished in the best possible manner.

The bearings of the upper cutter head are planed to fit to upright stands, which are cast solid to a bed, extending across the machine, which ties them rigidly together. These ways are fitted with a V, in which the bearings are bedded, which retains them always in line. This peculiar arrangement admits of a free access to the cutters, to sharpen or re-set when desired. The lower cutter head is also mounted in a heavy frame, with delivery spout for the shavings, and has a vertical adjustment up and down by means of hand wheel and screws, and is belted from the countershaft with open belts.

The pressure bars before the cut, or on the leading in-side of the upper cylinder, are attached to swinging arms, by which the bar is brought very close to the edge of the cutters, thus preventing tearing and splintering in cross-grained or knotty lumber. This bar is so attached to the swinging arms that it can be set forward or back to admit of working moulding, or drop siding cutters. The pressure bars upon the rear side are also adjustable back and forth. The bed under the upper cutter is made so it can be detached for the purpose of re-planing or adjusting when worn out of line by use. The

one for the under cylinder is easily removed when access to the cutters or pressure bars is desired.

The matching arbors are large, and run in long, self-oiling bearings, adjustable laterally across the bed; this distributes the friction of the lumber upon the bed-plate, and prevents unevenness of wear. The matching heads are made of gun metal, with steel screws and solid milled matching cutters, and are so arranged that a deep rabbet can be made with them for drop siding.

Six large feed rollers are used, two pairs in front of the main cylinder, and one pair in front of the matching works; these carry the lumber entirely through the machine, always keeping the board in a straight line. These feed rolls are mounted upon planed upright stands, fitted with socket joints, and connected by heavy expansion gearing. The gears are mounted on expansion links connecting the upper and lower shafts, and will open to receive 6 in. material. The weighted levers on the feed rolls are inside the frame.

The weight of the whole machine is about 6,700 lbs.

Contributions.

The Master Car-Builders on Rail Sections and Flange-wear.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It is to be hoped that the Master Car-Builders' Association as a body does not reach its conclusions in so incautious and ill-considered a way as have certain prominent members of that association in urging an important change in the customary form of rail section, against the too ready acceptance of which as a reasonable and defensible demand it is proper that a caution should be entered.

In protesting against hasty tampering with established practice I consider myself under no obligation to establish affirmatively the correctness of that practice, and still less to prove that the proposed remedy, instead of doing good to either rail or wheel, will in fact do harm to both, although the attached diagrams will show in brief how strong is the *prima facie* case to that effect. It clearly rests with those who propose a change to affirmatively prove the expediency of a change.

Many hundreds, if not thousands, of more or less capable men, have tinkered with rail sections in the last fifty years, including, no doubt, a great many foolish men, but also including a great many able and competent men, fitted by their training to consider the subject from every side. The all but unanimous conclusion heretofore has been that sections more or less closely resembling figs. 1-3, *i. e.*, having the corner of the rail of a shorter radius than the inside angle of the flange, were the proper form.

Recently, however, a committee of the National Car-Builders' Association, consisting of Messrs. Stanley Goodwin, R. C. Blackall and John W. Cloud, have condemned this form of rail, stating that they were "strongly of opinion" that it was "*by far* the greatest cause of sharp flanges," and recommending that the rail be rounded off to a radius of ⅝ in., so as to exactly fit the flange, as in the section shown in fig. 5 (which, however, is only ½ in. radius). The conclusions of a previous committee, that sharp flanges were due to special defects of trucks and wheels, bad gauge of wheels, trucks not square, wheels not the same diameter, overloading of side bearings, unequal loading of car, imperfect chilling, etc., etc., are passed over as quite secondary causes.

Immediately thereafter, Mr. M. N. Forney, Secretary of the Association, took up the matter in an elaborate paper presented at the 1884 convention, information for which was gathered by circular in the name of the Association, and which was (in effect) indorsed and accepted by the above committee as giving their views and relieving them from the necessity of making a separate report.

This paper has been very widely circulated. Officers of maintenance of way were formally invited to attend and take part in its discussion, and it may properly be considered (at least I think it is in fact so considered) as the presentation of the case which the car-builders have to make against rail sections; a kind of *quasi* official protest on their part against the carelessness of rail men in designing sections so as to cut wheels all to pieces.

Such a case is obviously entitled to a hearing, but as it also obviously has an enormous presumption against it, it is eminently proper to point out, as alone enough to condemn the paper referred to *as a basis of action*, that not only does it prove no case at all against the rails, *but it does not even attempt to.* In the whole 35 pages of the paper there is nothing bearing upon *how* and *why* the common form of rail section (figs. 1-3) is more harmful to wheels than that recommended in the paper (fig. 5) than the following few lines (page 7) in which the fact to be proved is taken for granted as self-evident:

> "As the maximum weight carried by car wheels is now from 5,000 to 8,000 lbs., the bearing surfaces must be subjected to pressures of from 40,000 to 64,000 lbs. per square inch. It is therefore not surprising that they are rapidly worn away, as *there is no principle in mechanics more firmly established or more certain than that the wear of surfaces in frictional or rolling contact is in an inverse proportion to their area.* THEREFORE if we should increase the area of the surfaces of the wheel and the rail which are in contact, the capacity of both for resisting wear will be increased. *To do this their forms must be made to conform to each other.* In other words, *the treads and flanges of wheels should be made of the same shape as the heads of the rails.*"

This has a plausible sound, but—besides the inherent improbability that truths so self-evident that they may be taken for granted have escaped recognition for fifty years—it needs no great care to see that there is a gap in the logic big enough to drive a coach and six through.

As respects *rolling contact only*, or as respects "frictional" or *rubbing contact only*, the proposition that increase of the bearing surface will decrease the wear may be admitted as self-evident, but when to increase the bearing surfaces in *rolling* contact we add new surfaces in *rubbing* contact, it is anything but "firmly established" or "certain" that we shall decrease the wear. In fact, it would seem a strange proposition to advance as even a probable result, and most assuredly requires to be established affirmatively and not taken for granted.

It needs but a glance at the proposed new section, fig. 5, to see that, since every point on the line of contact is at an unequal distance from the centre of the wheel, only *one point* on it can be in rolling contact; *every other point is continuously sliding on the top of the rail.* A simple computation shows that a difference of *one-seventy-fourth of an inch* in the radius causes that point to slip as fast on the rail as the outside (or inside) wheels must in passing around a 1-degree curve! In fig. 5 we have an extreme difference in radius of about ½ in., so that the extreme point of the line of contact would be slipping as fast as the tread would on a 37-*degree curve*, assuming all the slipping to be on one or the other rail.

This *may* be a good and wise way to reduce friction and wear, but a little proof of that fact would come in appropriately. Instead of this we find that the remainder of the paper (so far as it bears on this subject), although it has the appearance of a detailed investigation, adds nothing more in reality to the discussion than the matching together of a lot of rail and wheel sections, and showing that they do not fit, "saying in a solemn way an undisputed thing!" We all know that they don't fit; what we want is proof that they ought to fit.

Another palpable omission in the discussion is the absence of any attempt at a *diagnosis* of the disease to be cured before attemping to cure it; some attempt to determine its comparative extent and importance, lest in trying to save 10 per cent. of one dollar we lose (even if we succeed) 5 per cent. of $100. A natural impression for a maintenance of way man to derive from the action which has been taken is that there is some fearful loss from sharp flanges, imperatively needing a remedy. Absolutely, no doubt there is a great loss, and it comes so immediately under a car-builder's eyes that he naturally feels as if it must be stopped somehow; but comparatively it would appear to be one of the smallest of small items, not such as would warrant an appreciable deduction from the life of rails to save the whole of it.

According to the United States Census (1880)

Renewals of rails cost		4.41 cents per train-mile	4.41
All repairs of cars cost	freight	5.80	
	passenger	2.71	8.51

How much of car repairs is due to renewals of wheels is an open question. It may perhaps be assumed to be certainly less than one-half, and certainly over one-quarter of freight-car repairs, and a very much less proportion of passenger-car repairs. Allowing 40 per cent. if freight-car repairs and 15 per cent. if passenger-car repairs as due to maintenance of wheels would make the *total* cost of wheel service only 2.73 cents, against 4.41 cents for rails; but as the latter may well be larger than it will be when all iron is renewed with steel, we may admit that since the advent of steel rails the total cost of wheel service is somewhat more than rail service, perhaps 50 per cent. more.

But of this total only an insignificant fraction is due to flange-wear. Without attempting to determine it with any precision from the mixed, scattered and imperfect statistics available, it is not claimed, I believe, that more than about 8 per cent. of the wheels are removed for flange-wear on any large road, even the most crooked. Many crooked roads report only 1, 2 and 3 per cent. The Lehigh Valley, *on which this new cure-all has been in operation for many years*, reports 4 per cent., while such roads as the Boston & Albany, which is also a crooked line, and has not this advantage, report less than 1 per cent. Mr. Leander Garey has recently stated that *ninety per cent.* of all wheels removed are for cracked plates, leaving the remaining 10 per cent. to be divided up among half a dozen other causes, of which sharp flange is only one, and a minor one. Out of 86 wheels of the Michigan Central (Master Car-Builders' report, 1880,) only *one* had a worn flange, and out of 19 on the Grand Trunk (which claims to have especial trouble) only *two*. Altogether, it would probably be a fair estimate that 2 to 3 per cent. only of all the wheels condemned in the United States are for sharp flanges, and an extravagant estimate to say 5 per cent.

But now comes in an element that these gentlemen seem to forget. The percentage condemned is nothing to the purpose, the question is, how much *mileage* is lost? Now I am informed that wheels removed for sharp flanges have almost invariably made a fair, and often a high mileage, and that the average falls little below that of wheels removed for worn tread or other like causes. Out of 42 wheels given in the 1881 Master Car-Builders' report, 8 were for "sharp flanges"—an unusually large number—but the force of this fact is wholly destroyed by the fact that *their average mileage is considerably higher than that of wheels removed for any other cause, even the general one* "*worn out.*" Altogether it probably cannot be shown, as it certainly has not been shown, that there is any considerable *mileage* loss from sharp flanges at all, but to estimate it at 10 per cent. is—for any facts which as yet appear to the contrary—a liberal estimate.

This leads to the truly impressive conclusion, that the loss which we are asked to tamper with rail sections to save amounts to 10 *per cent. of* 8 *to* 5 *per cent.*, or from *a quarter to a half of one per cent.* of the total cost of wheel service.

To effect this petty saving, what do these gentlemen propose to do? To round off the corner of all rail sections to a ⅝-in. radius, instead of, say a ¼ or ⅜ radius, the effect of which, as a little mild arithmetic will show, is that if we assume that their new proposed rail sections will stand 10 lbs. wear on the head, by using

¼ in.	radius	for	⅝	in.	we add	14.08	p.c.	to	wearing	section	and life.
"	"	"	½	"	"	8.05	"	"	"	"	"
"	"	"	⅜	"	"	3.35	"	"	"	"	"

Cutting off *ten or twelve per cent.* from the effective wearing section of rails to save less than *one* per cent. of wheel mileage is rather a dear way of curing flange-wear, even assuming that the proposed remedy will cure it and bring no other and greater evils in its train!

In other ways the ill considered and incautious way in which conclusions have been jumped at in this matter is evident. Copying Mr. Forney's words (it is to be hoped with better warrant for using them), we may say that "there is no principle of mechanics more firmly established or more certain" than that the same cause, acting in the same way, at the same time, upon the same bodies, will produce the same effect. When, therefore, we find that although all wheels run over these wicked rails, yet only 3 to 5 per cent of them get sharp flanges, what probability is there that the form of the rail, which acts upon *all* wheels, is the real cause of this small loss? Is it not clear that the true cause must lie in defects special to the individual trucks and wheels which suffer—defects which it is the car-builders' special duty to study and correct—instead of in the rail sections, which it is well that they should study, but which it is beyond their power to correct?

Another fact shows the unwarrantable "previousness" of this charge against rail sections still more clearly: It is practically *an invariable rule that only one wheel on an axle has a sharp flange.* At the 1883 Master Car-Builders' Convention, Mr. Richard Williams, an English visitor, who talked much sound sense on this subject, which appears to have produced little impression, said: "I defy any of you to say you ever saw two sharp flanges on the same axle," and no one took up the challenge, except that Mr. Goodwin "thought" they were often found, although "not so common as one." Modifying Mr. Williams' challenge so as to except wheels which have rendered full average mileage before condemnation, the chances are strong that not a single instance can be found anywhere. Certainly, the exceptions are so rare as merely to prove the rule.

Another general fact increases the presumption against the proposed change. All examples of the *actual* wear of rails and (in the main) wheels, as shown by the examples of *actual* wear, even in Mr. Forney's own paper (as fig. 8) show that the rail naturally wears to a sharper instead of rounder corner, except on the outside of sharp curves, where it wears so as to "accurately fit the flange" (fig. 4), as these gentlemen would have all rails do. Similarly, wheels usually wear to increase, and rarely to sensibly decrease, the radius of the flange angle, the two becoming more and more *different* from each other instead of more and more nearly alike. While this only raises a presumption against the proposed change, it is a strong presumption, (*a*) because the laws of wear seem to be contrary to the assumed theory, and (*b*) because even if the theory were correct, the natural wear would soon bring the sections into substantially their present forms.

Reverting now briefly to the case in favor of the present form of rail section, we way say, perhaps, that "nothing in mechanics is more firmly established or more certain" than that in figs. 1, 2, 3 we have the positions the wheel assumes with reference to the present established form of rail section when from any cause it approximates as closely thereto as the flange permits; which is, perhaps, for one-tenth of the time (for any one wheel) on tangents and exactly one-fourth of the time on curves, the outside front flange only crowding hard against the rail. It will be seen that the bearing surface is as nearly as may be *purely rolling surface* in every case, there being a minimum of rubbing surface. Nevertheless some rubbing takes place of course, and with it wear, but I believe it to be now easily demonstrable from known facts that *practically the whole wear in such cases as fig.* 3, *on curves, is due to the longitudinal slipping only.* This, however, is very great, and under heavy traffic speedily produces the condition of things outlined in fig. 4, in which the fit between rail and wheel is even more perfect than our friends' ideal section, fig. 5, taken directly from Mr. Forney's paper! Of fig. 4 we may fairly say that "the villany they would teach us we have executed, and it has gone hard but we have bettered their instruction." Nevertheless fig. 4 is not generally regarded as an ideal form for a rail section, but if the assumption made in this paper is correct, that the nearer the flange and wheel fit each other the less the wear and friction, *then the rail and flange-wear on a worn out-side rail, fig.* 4, *should be less than on a new one, fig.* 3; or, what amounts to the same thing, a heavy globe, fig. 6, rolling down a plane surface, should have its friction and wear decreased instead of increased by rolling in a trough, fig. 7, so formed that it could "bear" (*i. e.*, rub) all around its circumference! If there be any one to whom such a proposition is not self-evidently absurd, it may be added that statistics now place it beyond reasonable doubt that the wear of outside rails in curves is *several times* greater when they have worn "to fit the flange" (fig. 4) than when they are new and do not fit it (fig. 3).

These facts certainly indicate, and to many they will perhaps seem practically to prove, that the proposed change will very materially increase rail-wear on tangents to something like what now exists on easy curves; and have a still worse effect on curves, by hastening the period when the flange cuts deeply into the rail-head. If so, it will also appreciably increase rolling friction and train resistance on both curves and tangents, and it will undeniably (compare figs. 1-3 with 4-5) increase somewhat the ease with which a flange, especially a defective flange, can climb a rail and cause derailment. Adding to this the admitted effect that the material in the rail

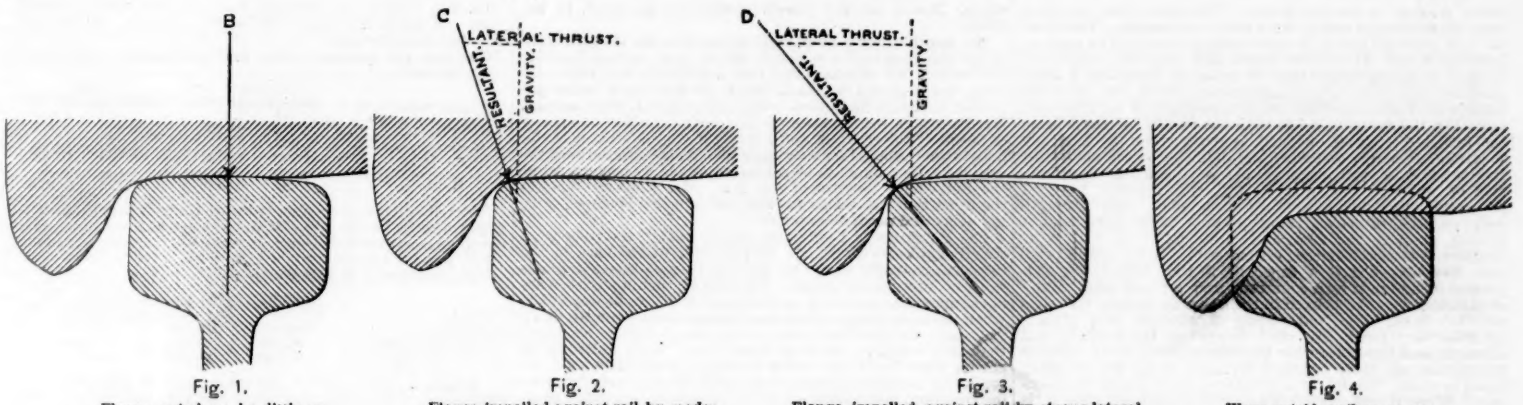


Fig. 1. Flange acted on by little or no lateral force, but as close to rail as its form permits without such force.

Fig. 2. Flange impelled against rail by *moderate* lateral force, as by impacts on tangents. (*C* gives line of pressure, perpendicular to bearing surfaces in contact.)

Fig. 3. Flange impelled against rail by *strong* lateral thrust, as on outside rail of curves. (*D* gives line of pressure; wheel rises till bearing surfaces in contact are perpendicular to *D*.)

Fig. 4. Worn outside rail on curves. (Worn so that rail and flange "conform to each other," as in fig. 5.)

Position of Wheel-Tread on Rails of Present Standard Forms when Forced Against Rail as Closely as Form of Flange Permits, by Varying Lateral Pressures.

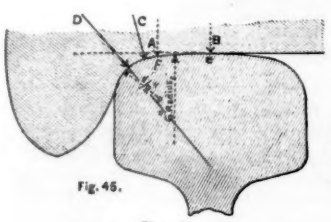


Fig. 5. Showing position of rail and wheel under any one of the conditions, figs. 1-4. (*Direction* of lines of pressure, *B*, *C*, *D*, only varies; flange always in same relation to wheel as in fig. 4.)

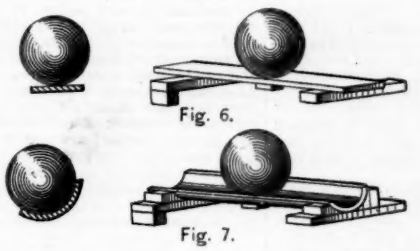


Fig. 6.

Fig. 7.

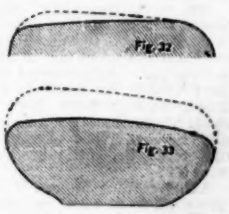


Fig. 8.

Proposed New Standard Rail-Section.

head available for wear is diminished, and that whatever increases rail-wear increases wheel-wear, we have a case which requires something more than assumption and guess-work to disprove, and which it would be the height of imprudence to disregard, by such an important action as a radical change in rail section, until it has been disproved.

Other points in this matter invite discussion, as, for instance, the rough and ready way of computing the crushing pressures and assuming their effect without consideration of the laws of elastic compressibility, which is certainly unsound; but enough has been said. Had the paper given merely the hasty conclusions of an individual, a shorter discussion or none at all might have sufficed; but as it comes before the railroad world, owing to the circumstances detailed, with all the force of a careful, deliberate and well-considered demand by the car building interest for the reform of an intolerable, or at least great evil, it has seemed essential to point out in detail that the demand is neither careful nor deliberate, nor well-considered, nor (probably) founded on any sound basis of fact or theory. C. E.

Accidents to the Locomotive "Oakland."

SHARPSVILLE, Mercer Co., Pa., March, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The New York *Sun* of March 5, under the caption "A Fatal Locomotive: Twice Wrecked at the Same Spot, and Now Exploding Not Far Away From It," contains a communication dated Wilkesbarre, Pa., March 3, the writer of which makes "a veteran railroad man," named Abel Garrett, hold forth thus:

"I hear that a locomotive known as the 'Oakland' blew up the other day on the Sharpsville Railroad, and killed her engineer; and that reminds me of two singular accidents that happened to the same locomotive." The narrator then gives the story of the "Oakland" that appeared in the *Gazette* of Nov. 14, 1884, giving the name of the engineer who ran the "Oakland" "in 1871," as "Charley Greene," and that of the weigh-master who was killed at the accident of "1871," as "Reilly." The story in the *Gazette* gives Greene's name as Charles, but in fact Greene's name was George. The name of the weigh-master was not given in the *Gazette* account: the man's name was Bryson.

Apparently the "veteran railroad man" should have credited the *Gazette* with the "Oakland" story.

But the fact concerning the "Oakland" to which I attach a principal importance just now is this: "that the engine in question did *not* blow up the other day," nor on any day.

J. M. G.

Check-Chains.

CLEVELAND, Ohio, March 6, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In reviewing the article in the *Gazette* of Feb. 27, on "Useful and Useless Check-chains," proposing to fix the slack left in the check-chains according to length of cars and degree of sharpest curves, I think more slack of chain will be required than the table indicates. Nevertheless, experience will show about the proper amount of slack. I would not recommend that the slack be sufficient to allow the trucks to go round the sharpest curves that can be found. Frequently it is found necessary to unhook the chains to get a coach or sleeper into some of our yards. I believe that in the matter of check-chains, as with most other things, there are both useful and useless. The latter are those where they are either too long or placed too near the centre of the truck, so as to allow the truck to swivel too far, and both pairs of wheels in the same truck to get off the rails. When that takes place, scarcely any attachments can be made strong enough to hold the truck from turning at right angles with the track.

I have seen these attachments made by screwing a hook or an eye into the car sills from the bottom edge. The first pull on them tears out the timber, destroying the sill and letting the chains free; those are among the chains that do not check. Now for the useful chains, and many cases could be cited where they have proved to be useful. I have known instances of a broken wheel where the chains allowed only one pair of wheels to leave the rails, and ran along, one wheel just inside and the other just outside the rails, for miles, and until the train was brought to a stop. For example, a parlor car was running "dead-head" over the road with no one in the car. One pair of wheels was off the track for six miles and it was only discovered at the station where the train had run on a siding to let a freight train pass. The pair of wheels being off the track under the parlor car allowed that car to hang over toward the main track, and as the freight train pulled by, the caboose struck the corner of the parlor car. That called attention to the condition of things.

The most recent case of useful check-chains coming to my notice was two years ago. A portion of the flange of a wheel under a post-office car in an express train broke off. At a favorable opportunity this wheel got on the outside of the rail. The other wheel ran along just inside the other rail, cutting off the track bolts. It was tracked for nearly two miles, one pair of wheels only off the track. As the train was passing through the yard at a station (not a stopping place for that train), another piece of flange broke, which flew and struck the air-brake pipe under the car, making a hole in the pipe, which allowed the air to escape and apply the brakes. This car had four-wheel trucks under it. These were chains that did check.

Last Friday morning I saw a sleeping car on its side on the ground, having left the trucks. The cause of this was, the snow had melted the day before and then frozen during the night, so that the ice was about even with the top of the rail. This car was needed early in the morning, and in pulling it out of the yard the forward pair of wheels left the track, striking a pile of frozen snow. This raised that side of that truck up; and, there being no key in the king-bolts and no check-chains to the trucks and body, the car left the trucks entirely and fell over on its side. Check-chains, I think, would have prevented this.

I have endeavored to present cases where check-chains have actually been useful, and one where they would have been useful. I have had charge of the car department of some portions of the Lake Shore & Michigan Southern Railway for nearly 30 years, and during that time have been to many wrecks of passenger trains, both before check-chains were used and since, and I am convinced that check-chains properly applied are useful. I wish to be understood that my strong faith in check-chains does not expect too much of a good thing. They won't prevent all kinds of railroad accidents. They are something like a good automatic car-coupler; they will do what they are intended to do, but will not furnish coupler and prevent collision also.

Now, I will state what, in my opinion, constitutes useful check-chains: "They should be placed as near each corner of the trucks as possible, the links of the chains made of not less than ⅝-in. iron, with the two end-links of the chains made of ¾-in. iron. Connect them firmly to the truck and body. For a truck of 7-ft. wheel-base, I would allow about 7 in. of slack; for a long wheel-base, say 11 ft., about 10 in. of slack. My experience has been that the proper places to make the connections are between the outside of the truck and the outside sills of the body. In this connection it may be proper to say that when a car goes into shop for general repairs, the check-chains should receive due attention to keep them in a useful state.

JOHN KIRBY,
Gen. Master Car-Builder L. S. & M. S. Ry.

[The slack thus allowed is considerably less than is common, but with check-chains as ordinarily attached, viz., to points from 12 to 18 in. apart vertically and from 9½ to 12 in. apart horizontally, it is a matter of simple calculation to show that 7 in. slack will permit from 9½ to 11⅛ in. horizontal movement of the truck check-chain eye, before the chain will come to a bearing. If the slack be 10 in., the horizontal movement will be from 12¾ to 15 in. If these check-chains are, as is usual, attached at points about 5 ft. and 6½ ft. respectively from the centre of the truck, this amount of slack will permit the truck to slew till it stands at an angle of from 8½ to 10½ degrees with the centre line of the car-body, the smallest of which angles will permit a very long car, 50 ft. between centres of trucks, to pass around a 30 to 35 degree curve. No doubt as sharp or even sharper curves may exist in the Buffalo and other shop yards, but how greatly the slack required in such cases is in excess of normal requirements *in regular service* is not perhaps always realized. On the entire length of the Lake Shore road there is probably not a single main line turn-out curve which is more than one-third as sharp as this. Therefore the fact that it is necessary to remove the check-chains to pass a sharp shop curve does not prove that the slack is not two or three times too great for the real requirements of service.

Whether the check-chain was really operative in one at least of the instances adduced would seem from the facts advanced to be at least doubtful.—EDITOR RAILROAD GAZETTE].

The Western Railway Club.

At the last regular meeting of the above club, held at Chicago, March 18, Mr. B. K. Verbryck, President of the Club, was in the chair. The subject for discussion was "The Best Material for Locomotive Piston-rods, Rocker-arms, Cross-heads, and Driving Boxes; and the best Forms of Packing for Pistons and Piston-heads."

MR. GEORGE W. STEVENS (Lake Shore & Michigan Southern) considered that steel gave from 40 to 60 per cent. more wear than iron. His road used steel exclusively for cross-heads and none have broken, whereas cast-iron has often failed. It used Dunbar piston-packing, which has run in some cases 14 years before renewal.

MR. ALLEN COOKE (Chicago & Eastern Illinois) had found steel piston-rods break square off at the cross-head. Iron, made of piled-up scrap drawn out under the steam hammer, gave better results. Steel did well for cross-heads and cast-iron for rocker arms. Frequent breakages occurred on Mogul engines of crank-pins 4½ in. diameter in the hub.

MR. W. FORSYTH (Chicago, Burlington & Quincy) thought this too small. Much depended on how steel rods and pins are made. If not properly annealed, they are hard and easily broken.

The best material for a cross-head depends a great deal on the form. The four-bar cross-head should be made of cast-steel. With two bars wide apart, a wrought-iron centre, and cast-iron gibs, is best, and with the Laird guide, a cast-steel body and cast-iron sliding block. Cast-steel cross-heads should have brass or cast-iron gibs to wear well.

A locomotive piston-rod is subject to more severe service than any other part of the machine. The alternate thrust and pull for each revolution of the driver causes alternate and equal tensile and compressive stresses. The factor of safety proper for the material to resist either of these stresses is only one-half that required when it is subject to both. In piston-rods it should be at least 10. The rod must also possess sufficient rigidity not to bend when subject to the load of the

initial pressure on the piston-head. The piston-rod has also a wearing surface on nearly the whole of its length. Therefore the best material suited to these conditions should be used regardless of cost. The elastic, tensile and compressive strength of steel is nearly twice that of wrought iron, and if these qualities only were to determine the size of the rod, we could make a steel piston-rod half the cross-section of an iron one; but when the diameter is less than one-twelfth of the length, the tendency to bend or buckle is greater than the tendency to stretch or crush; and when the diameter is calculated for this we find a steel piston should be nine-tenths the diameter of an iron one, and it will consequently have 81 per cent. the weight of an iron one. The strength and rigidity of steel being greater than iron, and it having greater hardness and uniformity, it will wear longer and is therefore the best material. In his road's practice, the piston-rod is a taper fit in the piston-head; it is pressed on and held by a round nut and a round pin. Many steel piston-rods had broken in the key way because the steel was too hard. The cold rolling of wrought iron gives it qualities very much like steel, increasing the hardness and strength, and these desirable qualities make it more suitable for piston-rods than ordinary wrought iron, and possibly equal to steel. The life of a piston-rod is limited by its diameter. When it gets worn down to such a diameter that it is not safe to run, it must be thrown away. This wear was much greater with the old hemp packing than with metallic packing.

MR. COOKE put a fillet in the piston-rod where it was turned down to enter the cross-head, and found most rods broke there, and not at the back end of the key-way, where the area was smallest.

MR. H. S. EDGERLEY (Michigan Central) considered that piston-rods broke from imperfect workmanship. Steel rods were preferable to iron. He ground the cross-head and piston-rod, and took great care in fitting the key-way, and never had a breakage. He preferred wrought-iron to steel or cast-iron for rockers. He used the Dunbar piston-packing, carefully fitted, without holes front or back. Their crank-pins are made of crucible steel, and will not break if properly handled and worked. The piston-rod is turned and ground, and driven into the piston-head with a heavy hammer, and held with a key.

A letter from Messrs. H. K. Porter & Co., of Pittsburgh, was read, from which we condense the following:

"We consider steel the best material for piston-rods, as it has no fibre; lasts well, is not easily corroded, and is cheaper. We bore the hole for the piston-rod taper and rivet the end. For cross-heads and rocker-arms we regularly use cast iron of special tough, close mixture. Cast steel cross-heads are stronger than cast iron, but do not wear so well, and cost more. Wrought-iron rocker-arms do not wear so evenly, and any accident strong enough to break a cast-iron rocker-arm had better break it, instead of damaging the much more expensive link motion.

"We use a simple form of piston packing. The piston-head is solid, but cored out for lightness, and grooved for two rings. A cylindrical pot of larger diameter than the finished rings, and large enough to make six or eight rings, is cast of a special quality of cast iron. Pieces are cut from this, the casting clamped together, turned to a true circle, and the rings cut off. This secures a packing turned to an absolute true circle, and yet always pressing out against the cylinder equally at all points. Rings of this kind have run for over two years in a shifting engine with very hard service."

MR. STEVENS was using several cast-steel driving-boxes with good success. On some roads they are said to cut the hub of the wheel.

A "Proposed Standard Freight Car Truck" will be discussed at the next meeting, and if time permits the subject of "Balanced Slide-Valves" will also be taken up.

Value of Boston Roads.

It is interesting to note how wide the existing differences are between the capitalization and the market values of some of the leading railroads in this vicinity at the present time.

In the following table we have taken the present selling prices of all the various stocks and bonds of the eight principal railroads terminating in Boston, and ascertained therefrom the selling price per mile of each road, as compared with the total par value per mile of the same road's existing stock and net debt:

	Selling price per mile.	Stock and net debt per mile.
Boston & Albany	$150.248	$96,393
New York & New England	58,895	114,080
Old Colony	63,372	45,530
Eastern	165,488	160,658
Foston & Maine	141,935	80,603
Fitchburg	116,037	87,438
Boston & Providence	123,750	74,716
Boston & Lowell	116,403	92,416

One of the suggestions of this table is that the circumstances which determine the value of a piece of railroad property are varied. The Eastern, for example, is not only carrying a larger capital and debt per mile than any of the roads named, but it is selling to-day at figures in excess of its large capital and indebtedness, and if the present hopes of its friends are realized by the speedy resumption of dividends, of course the selling price will be still further enhanced. The certificates of indebtedness of the Eastern Railroad are selling to-day at above $150,000 per mile. But it is the superb passenger business of this road which gives it its great value, and much of its indebtedness was accumulated in obtaining the valuable ownership in other roads and leases by which this passenger traffic is obtained.

The New York & New England presents another phase of the subject of railroad values, for with the par value of its capital and net debt per mile $1,14,080, it is selling at only $58,895. The New York, New Haven & Hartford Railroad, which pays 10 per cent. dividends, and is one of the most profitable railroads in the country, has about the same stock and debt per mile as the New York & New England.

The low figure per mile represented by the share capital and indebtedness of the Old Colony is due to the fact that a large portion of the mileage of that company, outside of its main line, consists of single track. Although so many of the railroads of New England are selling above the par value of their stock and net debt, yet it is doubtful if the excess is equal to the advance which has taken place in the value of real estate in their neighborhood since the roads were built.—*Boston Commercial Bulletin.*

The Present General Condition of Freight Cars for Interchange Traffic.

The last regular monthly meeting of the Master Car-Builders' Club was devoted to the discussion of this subject, President Leander Garey in the chair.

The President opened the discussion, stating it to be a matter of notoriety that the average condition of cars was growing worse and worse. Messrs. Mileham and Blackall dwelt especially on the inferiority of the wheels which are now put under many cars, and deemed that formal protests should be made. Nearly all the wheels complained of crack in the plate.

Mr. Smith urged a more rigid inspection, but thought some of the rules had been too hastily passed and were difficult to live up to. Mr. Mileham said that a difficulty was that cars were not repaired in slack times, because they were not needed, and busy times they could not be spared from service. Mr. Partridge mentioned a specific instance where the policy of buying "the cheapest thing on eight wheels" that could be bought was adopted for a through line, on the ground that the cars were then likely to be rather improved by repairs, while the immediate investment was less. Mr. Blackall thought the inspection was rather too fine and impeded business, causing delay and needless expense.

The PRESIDENT: I am quite positive that if the rules were strictly applied with us, not 10 per cent. of the cars in the interchange traffic would be allowed to pass inspecting stations or interchange points. The idea of turning those cars back upon the owner is a good one if it can be done; but when the interchange traffic was inaugurated, some 18 or 19 years ago, the cars then were in very much better condition than they are now, and they found very much difficulty in getting them from one road to another. Since that time we gradually have become familiarized with the necessity for moving freight to destination whenever presented, if possible to do so without transfer. Now there are roads which have put cars in that traffic that never saw the cars from the time they were put in until they were worn out. I have learned of cases of cars placed in that traffic which had not been seen for 10 or 11 years, until they were sent home in a condition of general debility, unfit for further service. If freight is to be moved, and is offered in a car that can be passed to destination with safety, it ought to be done, and the car got home as soon as possible thereafter; but the railroad companies cannot be made to see the necessity of repairing cars at home so as to be in condition to run safely and at the least possible expense. I do not know that the time will ever come when they will do so, for it will not be until they have at one and the same time an immense traffic and a large stock of cars which they cannot use. Some of the Eastern roads have fought hard for a closer inspection, and I think they are right in so doing, if it could only be followed and enforced on the whole length of the trunk lines.

The subject selected for the April meeting was "Cast-iron Chilled Wheels," and railroads were requested to send samples of wheels that have failed by breakage.

Proposals for Bridge in New South Wales.

Saul Samuel, General Agent of New South Wales, No. 5 Westminster Chambers, London, advertises not only in England but in Germany for plans and proposals for the building of a steel bridge to carry a double-track railroad over the Hawkesbury River, near Sydney, New South Wales. The length of the bridge from abutment to abutment will be about 2,900 ft., and it must have a clear height of 40 ft. above high water. The average depth of the stream is about 50 ft., and the foundations must go about 12 ft. below the river bed. Further information and details, with map of the location, may be had of the General Agent on payment of a guinea.

ANNUAL REPORTS.

The following is an index to the annual reports which have been reviewed in previous numbers of the current volume of the *Railroad Gazette*:

Terre Haute & Indianapolis.

This company owns a line from Indianapolis, Ind., to the Illinois State line near Terre Haute, 79.4 miles, with 33.822 miles of coal spurs and sidings, and 53.434 miles of ordinary sidings. The report is for the year ending Oct. 31.

The company operates under lease the St. Louis, Vandalia & Terre Haute, 158.3 miles, and the Terre Haute & Logansport, 182.7 miles, but the accounts of these roads are stated separately.

The equipment consists of 47 locomotives, 22 passenger, 5 postal, 11 baggage and 6 express cars; 347 box, 79 stock, 12 wood-rack, 96 flat, 1,140 coal and 23 caboose cars; 1 directors' car, 1 pay-car, 1 wrecking, 1 crane and 41 work-train flat cars. There are also 100 leased coal cars on the road.

The general account is as follows, condensed:

Stock		$1,988,150
Funded debt		1,600,000
Bills payable		522,300
Accounts and balances		871,318
Income account, surplus		1,420,127
Total		$5,401,895
Road and equipment	$3,469,988	
Securities owned	970,620	
Betterments to leased lines	167,033	
Supplies	190,365	
Accounts and balances receivable	1,294,997	
Cash	308,272	
		6,401,895

The funded debt consists of first mortgage bonds, $1,215,000 coupon and $385,000 registered. There was no change in stock or bonds, but a decrease of $64,600 in bills payable.

The traffic for the year was:

Train miles:	1883-84.	1882-83	Inc. or Dec.	P. c.
Passenger	228,586	224,909	I. 3,677	1.6
Freight	474,284	498,257	D. 23,973	4.8
Service and switch	415,685	432,027	D. 17,342	3.8
Total	1,118,555	1,155,193	D. 36,638	3.2
Passenger car-miles	1,463,843	1,445,938	I. 17,905	1.2
Freight car-miles	10,449,081	11,152,660	D. 703,579	6.3
Passengers carried	339,870	340,144	D. 274	0.1
Passenger-miles	12,221,035	12,490,434	D. 269,399	2.2
Tons freight carried	1,367,303	1,541,492	D. 174,189	11.3
Ton-miles	74,362,830	82,644,861	D. 8,282,031	10.0
Av. train load:				
Passengers, No.	53	56	D. 3	5 4
Freight, tons	157	166	D. 9	5.4

Of the freight car mileage 71.5 per cent. was of loaded cars. Of the total tonnage carried 50.9 per cent. was through and 49.1 local freight.

The rate per passenger-mile and per ton-mile were as follows, in cents:

	Passenger.		Freight.	
	1883-84.	1882-83.	1883-84.	1882-82.
Local	2.785	2.819	1.647	1.819
Through	2.279	2.326	0.670	0.725
Average	2.507	2.557	0.976	1.066
Cost	1.723	1.873	0.798	0.798
Net	0.784	0.684	0.178	0.268

The reduction in passenger rates was largely due to the carrying of large parties to political meetings at low rates. The earnings per train-mile last year were 102.5 cents; expenses, 73.2; net, 29.3 cents.

The earnings for the year were:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Freight	$726,086	$880,635	D. $154,549	17.6
Passengers	306,327	319,381	D. 13,054	4.1
Mail and express	81,260	77,312	I. 3,954	5.1
Rents, etc.	13,709	20,362	D. 6,653	32.6
Total	$1,127,388	$1,297,690	D. $170,302	13.1
Expenses	804,606	893,587	D. 88,981	9 9
Net earnings	$322,782	$404,103	D. $81,321	20.1
Gross earn. per mile	14,199	16,344	D. 2,145	13.1
Net " " "	4,065	5,089	D. 1 024	20.1
Per cent. of exps.	71.37	68.86	I. 2.51	....

Taxes are included in expenses. The decrease in earnings last year was not greater than on all other roads carrying the same class of traffic as this line.

The income account is as follows:

Net earnings, as above		$322,782
Interest received on investment		52,274
Total		$375,056
Interest on bonds	$112,000	
Loss on St. L., Van. & T. H. lease	14,310	
Loss on T. H. & L. lease	83,449	
Dividends, 8 per cent	159,052	
		368,811
Balance, surplus for the year		$6,245
Balance, Nov. 1, 1883		1,413,882
Total surplus, Oct. 31, 1884		$1,420,127

During the year 5 heavy engines were bought, and one yard engine built; three old engines were broken up and four light ones sold to the Terre Haute & Logansport.

There were 3.221 miles of new sidings built, including a quarry branch 2.405 miles long. There were 526 tons of steel rails and 24,094 new ties used in renewals.

The decrease in earnings was due to general depression of business; to a loss in coal traffic on account of a miners' strike, and to the very low rates on through business due to competition. Economies in management were partly offset by extra expenses due to the unusually high water, to the purchase of real estate and the payment of judgments for damages. The road and equipment were fully maintained and are in excellent order.

ST. LOUIS, VANDALIA & TERRE HAUTE.

This road extends from the Indiana State line near Terre Haute to East St. Louis, 158.3 miles. There are 43.812 miles of sidings.

The equipment consists of 44 locomotives; 14 passenger, 7 baggage, 1 postal, and 2 express cars; 821 box, 306 stock, 100 flat, 254 coal, and 23 caboose cars; 104 service cars.

The capital account of this company is as follows, condensed:

Common stock		$2,383.016
Preferred stock		1,544,700
Funded debt		4,499,000
Accounts and balances		110,767
Income account		228,417
Total		$8,765,900
Road and equipment	$8,343.623	
Accounts receivable	419,138	
Cash	3,139	
		8,765,900

The funded debt includes $1,899,000 first 7s and $2,600,000 second 7s.

The rental of the road for the year was $447,092; interest and other charges were $365,332, leaving a surplus of $81,760, which, added to the surplus from previous year ($146,657) makes a total of $228,417.

The traffic for the year was:

	1883-84	1882-83.	Inc. or Dec.	P. c.
Train miles	1,464,000	1,505,502	D. 41,502	2.7
Pass. car miles	2,916,521			
Freight car miles	15,604,962			
Passengers carried	323,201	316,963	I. 6,238	1.9
Passenger-miles	18,741,460	18,585,282	I. 156,178	0.8
Tons freight carried	1,144,510	1,191,083	D. 46,573	3.9
Ton-miles	104,209,720	111,810,481	D. 7,600,761	6.8
Average rate:				
Per pass.-mile	2.425 cts.	2.448 cts.	D. 0.023 ct.	0.9
" " " net.	0.593 "	0.266 "	I. 0.327 "	122 9
" ton-mile	0.843 "	0.979 "	D. 0.136 "	13.9
" " net	0.103 "	0.174 "	D. 0.071 "	40.8

The train mileage was: Passenger, 420,853; freight, 973,854; other, 69,293; total, 1,464,000. Of the freight car mileage 72.4 per cent. was of loaded cars. The average rate on through freight was 0.637; local, 1.991 cents.

The earnings for the year were:

	1883-84.	1882-83.	Inc. or Dec.	P.c.
Freight	$878,460	$1,091,462	D. $216,002	19.7
Passengers	454,518	454,981	D. 463	0.1
Mail, etc.	157,330	151,511	I. 5,819	3.8
Total	$1,490,308	$1,700,954	D. $210,646	12.4
Expenses	1,114,765	1,306,067	D. 191,302	14.7
Net earnings	$375,543	$394,887	D. $19.344	4.9
Gross earn. per mile	9,414	10,745	D. 1,331	12.4
Net earn. per mile	2,372	2,495	D. 123	4.9
Per cent. of exps.	74.8	76.8	D. 2.0	....

The earnings per train-mile were 106.7 cents; expenses, 79.9; net, 26.8 cents.

The rental of the road (30 per cent. of gross earnings) was $447,092, showing a loss of $71,549 on the lease. Of this loss one-fifth ($14,310) was paid by the Terre Haute & Indianapolis Co.

During the year 3 heavy passenger engines were bought and a switching engine built to replace an old one condemned. There were 1,593 tons steel rails laid, making the entire main track now of steel. The work of ballasting the line was completed. The cost of betterments to the road was $73,240, the chief items being for cutting down grades, filling trestles, new sidings (2,109 miles) and ballasting.

The reduction in earnings was due to general depression in business and to falling off in coke freights, and especially to the extremely low rates prevailing on through freight. There was also a light grain crop on the line.

TERRE HAUTE & LOGANSPORT.

This road as now completed extends from Terre Haute, Ind., to South Bend, 182.7 miles. For about three-fifths of

last year it was operated to Marmont, 149.5 miles, and for the rest to Plymouth, 159.7 miles. The 23 miles from Plymouth to South Bend were not completed until after the close of the year.

The equipment includes 8 locomotives; 6 passenger and 3 baggage cars; 33 box, 6 stock, 16 flat, 593 coal and 8 caboose cars. There are also 136 leased coal cars in use.

The traffic for the year was:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Train miles	548,528	473,701	I. 74,827	15.8
Passenger car miles	598,239	.....	.. ..	...
Freight car miles	3,421,496	.....	.. ..	...
Passengers carried	240,665	214,871	I. 25,794	12.0
Passenger-miles	4,201,162	3,613,037	I. 588,125	16.3
Tons freight carried	264,627	260,052	I. 4,575	1.8
Ton-miles	22,205,439	18,074,603	I. 4,130,836	22.9
Average rates:				
Per passenger-mile	2.601 cts.	2.781 cts.	D. 0.180 ct.	6.5
Per passenger-mile loss	0.103 "	1.108 "	D. 1.005 "	90.7
Per ton-mile	0.989 "	1 123 "	D. 0.134 "	11.9
" " loss	0.030 "	0.183 "	D. 0.153 "	83.6

The earnings per train mile were 67.6 cents; expenses, 67.2; net, 0.4 cent. Of the freight car mileage 64.8 per cent. was of loaded cars. The average rate was, on through freight 0.547; local, 1.224 cents; through freight forming about one-third of the total. The passenger rate was diminished by the large number of excursion passengers carried at low fares. The mileage of passenger trains was 182,257; freight, 323,453; other, 42,818; total, 548,528.

The earnings for the year were:

	1883-4.	1882-83.	Inc. or Dec.	P. c.
Freight	$219,625	$202,918	I. $16,707	8.2
Passengers	109,279	100,475	I. 8,804	8.8
Mail, etc	13,201	10,519	I. 2,682	25.5
Total	$342,105	$313,912	I. $28,193	9.0
Expenses	340,028	376,642	D. 36,614	9.7
Net or deficit	N. $2,077	$62,730	.....	....
Gross earn. per mile	2,221	2,695	D. $474	13.9
Net earn. per mile	14	.....	.....	....
Per ct. of expenses	99.4	120.0	D. 20 6	....

The rental (25 per cent. of gross earnings) was $85,526, making the loss to the lessee $83,449, against $141,208 in the preceding year.

Earnings were diminished by the decrease in rates, and expenses were increased by the great excess of north-bound tonnage. With the opening of the line to South Bend a large south-bound traffic in lumber is expected. All renewals and improvements are included in expenses.

During the year 499 tons of steel rails and 10,193 new ties were laid; 1,475 miles new sidings were built. There remain 77.1 miles of iron in the main track.

Philadelphia, Wilmington & Baltimore.

This company operates the Philadelphia, Wilmington & Baltimore, main line, 94.99 miles, with 27.48 miles of branches; the Philadelphia & Baltimore Central, 79.06; the Delaware Railroad and branches, 99.97; the Queen Anne & Kent, 25.86; the Delaware & Chesapeake, 54.60; the Cambridge & Seaford, 27.25, a total of 409.21 miles of road. The company also owns a branch from Perryville, Md., to Port Deposit, which is leased to the Columbia & Port Deposit Co.

The Philadelphia & Baltimore Central road is owned through ownership of the entire stock. It includes the former West Chester & Philadelphia road. The Delaware road is leased (this company also owning a majority of the stock) for 30 per cent. of the gross earnings. The Queen Anne & Kent road is controlled and operated, this company owning a majority of the stock. The Dorchester & Delaware and the Cambridge & Seaford roads are owned through ownership of their entire stock.

The equipment includes 128 locomotives; 189 passenger, 38 baggage and 20 express cars; 1,055 box, 56 stock, 589 gondola and 39 caboose cars; 288 road and service cars. There was an increase of 1 baggage and 100 box cars.

The general account, condensed, is as follows:

Stock		$11,818,350
Funded debt		3,637,667
Accounts and balances		1,067,768
Profit and loss		1,299,469
Total		$17,823,254
Road and property	$14,148,970	
Stocks and bonds	1,994,116	
Sinking funds	224,000	
Materials	378,189	
Accounts receivable	267,488	
Cash	900.491	
		17,823,254

The funded debt includes $1,000 convertible 7s, overdue; $2,500,000 registered 6s; $1,000,000 registered 5s, $76,667 ground rents and $60,000 ten-year notes, due 1887.

The traffic for the year was:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Train-miles:				
Passenger	2,100,591	2,049,231	I. 51,360	2.5
Freight	1,847,131	1,823,615	I. 23,516	1.3
Service	53,640	63,090	D. 9,450	15.0
Total	4,001.362	3,935,936	I. 65,426	1 7
Pass. car miles	10,104,994	9,542,357	I. 562,637	5.9
Freight car miles	20,178,986	20,409,056	D. 230,070	1.1
Passengers carried	5,270,590	4,612,243	I. 658,257	14.3
Passenger-miles	121,025,885	111,634,453	I 9,391,432	8.4
Tons freight carried	2,001,543	2,024,227	D. 22,684	1 1
Ton-miles	112,961,695	111,977,216	I. 984,479	0.9
Av. train load:				
Passengers, No.	58	54	I. 4	7.4
Freight, tons	61	61	.....	....
Av. rate:				
Per pass.-mile	2.377 cts.	2.441 cts.	D. 0.064 ct.	2.6
" " net	0.717 "	0.659 "	I. 0.058 "	8.8
Per ton-mile	2.235 "	2.312 "	D. 0.077 "	3.3
" " net	0.503 "	0.457 "	I. 0.046 "	10.1

Of the freight-car mileage 69.6 per cent. was of loaded cars. Locomotive service cost 16.55 cents per mile run.

The fruit traffic from Delaware and the Eastern Shore was as follows:

	1883-84.	1882-83.	1881-82.	1880-81.
Car-loads peaches	3,631	3,344	5,182	78
" berries	1,144	999	1,034	839
Weight in tons	38,202	34,748	49 728	7.333
Total revenue	$225,614	$216,472	$295,574	$50,315
Proportion, main line	104,143	98,426	146,136	21,437
" Delaware R. R.	108,239	101,636	130,426	28,878
" branches	13,232	16,410	16,012	.....

The peach crop last year was very good, and the berry traffic, which is much steadier than the peach business, showed an improvement, being the largest ever carried. The heaviest peach crop was in 1879, when 9,072 car-loads were carried.

The earnings for the year were as follows:

	1883-84.	1882-83.	Inc. or Dec.	P. c.
Passengers	$2,939,103	$2,795,699	I. $143,404	5.1
Freight	2,506.583	2,641,805	D. 75,222	2.9
Mail and express	280,363	206,145	I. 14,218	5.3
Rents	34.274	38,023	D. 3,749	9.9
Total	$5,820,323	$5,741,672	I. $78,651	1.4
Expenses	3,965,145	4,065,775	D. 100,630	2.5
Net earnings	$1,855,178	$1,675,897	I. $179.281	10 7
Gross earn. per mile	14,223	14,685	D. 462	3.1
Net " " "	4.533	4.286	I. 247	5 8
Per cent. of exps.	68.13	70.81	D. 2.68	....

This is one of the very few important roads on which passenger earnings are greater than freight. On the main line they very largely exceed the freight receipts.

The income account, showing the earnings of each line separately, is as follows:

	Earnings.	Expenses.	Net or Deficit.
P. W. & B. and branches	$4,350,129	$2,736,386	N. $1,613,743
Phila. & Balt. Cent	711,802	571,736	N. 140,066
Delaware R. R	637,573	456,427	N. 181,146
Queen Anne & Kent	29,065	47 329	D. 18,264
Del. & Chesapeake	74,136	113,896	D. 39,760
Cam. & Seaford	17,618	39,371	D. 21,753
Total	$5,820,323	$3,965,145	N. $1,855,178
Interest received, etc			72,814
Profit on Delaware lease			60,682
Total			$1,988,674
Interest		$216,029	
Rentals		331,229	
Taxes		47,682	
Dividends, 8 per cent		945,088	
Advances, Del & Chesapeake		17,943	
Sundry items		5,478	
			1,563,559
Surplus for the year			$425.115
Profit and loss, less depreciations, etc			874,354
Balance			$1,299,469

The earnings of the Philadelphia, Wilmington & Baltimore proper were $35,520 gross and $13,177 net per mile.

The report of the President says: "The increase in gross earnings shown by the foregoing tables was derived entirely from passenger traffic. There was a slight decrease in the volume of tonnage moved. The fruit traffic showed a gain over the preceding year.

"The condition of your lines was steadily improved during the year; there were put in the track 2,248 tons of steel and 1,687 tons of iron rail, and 268,765 ties. Additional sections of the road were ballasted with stone and cinder, and large expenditures were made upon the different divisions in repairing and strengthening bridges, and in other improvements necessary to the proper accommodation of the traffic of your line.

"The passenger and freight equipment were fully maintained, and 100 additional box cars were placed upon your main line. The light engines formerly in use are being steadily replaced by heavier and more effective power.

"It will be seen that the operation of the Delaware Railroad yielded a surplus over and above the rental. The Queen Anne & Kent Railroad, the Cambridge & Seaford Railroad and the Delaware & Chesapeake Railway, while showing a loss from their direct operation, contributed considerable traffic to the main stem and the Delaware Division.

"The Philadelphia & Baltimore Central Railroad shows improved results for the year, its earnings being almost equal to the entire amount of its fixed charges.

"The convertible mortgage loan of your company, maturing July 1, 1884, was mostly converted into stock, which explains the increase in that item shown on the balance sheet herewith.

"In November last the New York, Philadelphia & Norfolk Railroad Co. completed and opened its road to Cape Charles City, which, through the steamboat connection with Norfolk, Va., opens up a new and very direct route between the South Atlantic Coast and Philadelphia and New York. The new line connects with your Delaware Division at its southern terminus, Delmar, and the facilities afforded by this route will no doubt attract to the line a fair portion of the through traffic, and especially, through the saving in time, the perishable freight requiring quick delivery in the Eastern cities. As such traffic passes over your leased Delaware Railroad and that part of your main stem between Wilmington and Philadelphia, it is believed that increased revenue will result to this company therefrom."

Union Pacific.

In view of an unavoidable delay in preparing the full report of this company, President Adams has issued a preliminary statement for the year ending Dec. 31, which is given in substance below.

The statement shows that for the first half of the year there was a deficit of $383,614 and for the second half a surplus of $3,346,100, and adds:

"It is necessary to bear in mind that the various measures of economy which had been matured and entered upon during the first half of the year, did not produce their effect until the second half. Before the close of the first half also, the work of construction then going on had been practically brought to a close. The better financial results of the last six months, therefore, were largely due to causes which originated in the previous six months, but which developed their effects at a later period.

"The following is a condensed statement of the financial results of the year 1884 as compared with those of the year 1883, including the entire system worked by the company, but excluding the St. Joseph & Western:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings	$26 205,071	$29,341,010	D. $3,135,939	10.7
Exps. and taxes	15,113,053	15,899,402	D. 786 349	4.9
Net earnings	$11,092,018	$13,441.608	D. $2,349,590	17.5
Interest, etc	7,591,837	7,081,526	I. 560,311	7.9
Balance	$3,500,181	$6,410,082	D. $2,909,901	45.4
U. S. requirements	1,187,111	1,869,958	D. 682,847	36.5
Surplus	$2,313,070	$4,540,124	D. $2,227,054	49.2
Trustees K. P. mortgage	649,415	616,700	I. 32,715	5.3
Total surplus	$2,962.485	$5,156,824	D. $2,194,339	42.5
Dividends	1,065,197	4,260,788	D. 3,195,591	75 0
Balance	$1,897,288	$896,036	I. $1.001,252	111.7

"During the past year there have been expenses and loss in receipts not likely to occur again, as follows:

"1. An increase in taxes of $245,753 due to a law of Nebraska, which took effect in 1884, requiring taxes assessed for each year to be paid within the year, instead of during the six months following, as had theretofore been customary. Accordingly, a portion of the taxes for the year 1883, as well as the whole of the taxes for the year 1884, had to be paid during the last named year.

"2. Owing to the litigation in which the St. Joseph & Western Railroad has been involved during the past year, the tolls due from it to the St. Joseph Bridge Co. have not been though they soon will be. These tolls are properly a receipt of the system, as the stock and bonds of the bridge company are all owned by the Union Pacific. The revenue from this source would have amounted to $101,865.

"If these two items are added to the surplus for 1884, as given above, the aggregate will be $3,310,104, which is, as nearly as can be stated, the actual surplus income of the company for the year. It represents 5.4 per cent on the company's stock.

[The balance sheet, showing comparatively the status of the assets and liabilities, puts the latter down at $222,333,523 as against $212,259,943 to Dec. 31, 1883, an increase of $10,073,579. The capital stock is $60,868,500; the funded debt (gross) is $90,760,582, and less $6,587,297 held in the Kansas Pacific consolidated trust, it amounts to $84,173,285 or $333,647 less than a year ago; the United States 6 per cent. currency bonds aggregate $33,539,512, and the interest due amounts to $15,324,738. The floating debt is $3,237,696, or $244,959 less than on Dec. 31, 1883, beside which there is interest accrued not yet due amounting to $788,670. The income accounts are $25,859,336 less deficit of United States requirements as compared with accrued interest on the United States bonds from Feb. 1, 1880, to date, amounting to $1,451,215, making the actual sum under this item $24,401,121 or $9,202,133 more than last year.

Under the assets the cost of road construction and equipment expenditure since the consolidation is reckoned at $158,918,607, an increase over last year of $1,526,967; the investments of the company in the securities of other corporations and advances to auxiliary companies, payable in bonds and stocks, amount to $46,133,101; the Denver Extension bonds held in the sinking fund are $407,000; fuel, material and stores on hand are estimated at $1,220,612, and land contracts, land, cash, etc., amount to $15,654,202.]

"With a view to ascertaining the actual condition of the company, thorough inventories of supplies on hand and equipment have been taken, and its books have been subjected to rigid scrutiny. All this work has been done within the last six months. As a result, various accounts, which are specified and explained in the detailed report, have, by order of the directors, been closed and charged off, or reduced. The aggregate of corrections thus made ($1,605,896) has been deducted from the accumulated income account. This account, as appeared in the last annual report of the company, aggregated $8,255,121 on Dec. 31, 1883. It has now been increased by the surplus income of $2,639,341 for the year 1884, so that it would have amounted to $10,894,462 on Dec. 31, 1884. Against this has been charged the aggregate of corrections ($1,605,896), leaving as the balance for Dec. 31, 1884, $9,288,566, or an increase of $1,033,444 for the year, after charging off all losses, deficiencies, and open book entries of the last and all preceding years, since the consolidation of 1880 as well as the dividend paid April 1, 1884, of 1.75 per cent. The accumulated deficiencies, open accounts, and disputed credits, since the consolidation of 1880, have thus practically been charged off against the surplus income of 1884; which has sufficed to meet them all after paying a dividend of 1.75 per cent., and yet leave a balance of $1,033,444, equal to 1.7 per cent. on the company's capital stock, to be added to the accumulated income account of previous years. It is believed that all open or suspended accounts have now been closed and charged off, and the books represent, as nearly as possible with so large a concern, the exact condition of the company's property. Full details as to all amounts charged off are given in the annual report. They include the sum disallowed by the Court of Claims on the company's charge for carrying the mails since the consolidation of 1880, the decrease in value of material on hand, and such book charges as are unavoidable in the accounts of large corporations covering a series of years. There is nothing about them calculated to excite unusual comment.

"The net floating debt of the company, as appears by the following table, was $3,482,655 on Dec. 31, 1883. During the first six months of the year it had increased by the sum of $3,417,521 to $6,900,177. During the last half it was decreased to $3,237,696.

	Dec. 31. 1883.	June 30. 1884.	Dec. 31. 1884.
Liabilities:			
Bills payable	$3,398,001	$7,205,533	$5,708,769
Accounts payable	1,503,707	2.542,424	2.478,649
Pay-rolls and vouchers	2,907,612	1,969,997	1,691,004
Dividends unpaid	1,149,144	83,885	78,647
Coupons due and unpaid	1,249,962	1,276,182	1,328,527
Called bonds	22,000	32,000	21,000
Totals	$10,230,426	$13,110,020	$11,306,505
Assets:			
Cash	$1,403,653	$1,192,071	$712,963
Company stocks and bonds	2,099,434	2,072,353	3,578,160
Sinking funds in hands of trustees	122,947	32,000	159,110
Bills and accounts receivable	3,121,737	2.913,419	3,618,665
Totals	$6,747,771	$6,209,843	$8,068,898
Net debt	$3,482,655	$6,900,177	$3,237,697

"The total outstanding funded debt of your company, which does not include the funded debts of the auxiliary, independent organizations in which the company is interested, amounted on Dec. 31, 1884, to $84,173,285, as compared with $84,506,332 on Dec. 31 of the previous year, showing a decrease for the year of $333,047. The net reduction of the entire debt, funded and floating, during the year was $578,006.

"The land sales of the company during the year, after deducting sales canceled, were as follows:

	Union Pacific. Acres.	Union Pacific. Amount.	Kansas Pacific. Acres.	Kansas Pacific. Amount.
1883	805,833	$2,436.767	218,185	$965,556
1884	4,321,042	6,517,773	452,566	1,917,876
Increase, 1884	3,515,209	$4,081,035	234,380	$952,319

"The annual report will present a detailed view of the operations of the following: I. Union Pacific Railway Co. II. Union Pacific System. III. Operated lines. IV. Companies in which the Union Pacific Railway Co. has a proprietary interest, but the roads belonging to which it does not operate. V. Companies other than railroad companies in which the Union Pacific Railway Co. has a proprietary interest. VI. Land Department. VII. Coal Department.

"It is believed that the statistics submitted will enable all interested in it to form a reliable judgment as to the doings and value of the property, both as a whole and in detail. The litigation between the company and the government, growing out of the Thurman act, was brought to a close, so far as the case pending in the Court of Claims was concerned, early in January, 1885, while the report was in preparation, though not within the year covered by it. Of the two claims advanced by the company, and at issue in the case, one, that relating to net earnings, was decided in its favor; while the other, that relating to compensation to be paid for postal service, was decided against it. As a net result, under the ruling of the Court of Claims, the United States Commissioner of Railroads finds that the company was indebted to the government to Dec. 31, 1883, in the sum of $916,704.02. This judgment, together with the government requirements for the year 1884 under the Thurman act, the company is prepared to discharge as soon as the exact amount can be stated. It will be between $850,000 and $920,000, and the necessary funds to meet either amount are now on deposit with a trust company. In making this payment the company has reserved its rights on appeal. A considerable step has thus been taken toward bringing to an end the long and vexatious litigation which the directors felt themselves in duty bound to carry on in defense of what they were advised were the rights of the stockholders of the company. The regular annual report will be ready for distribution within the next two weeks."

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

THE TRUNK LINE POOLS.

At a meeting of the trunk line presidents last Monday, it was agreed to continue the east-bound and west-bound pools during April, and business will be divided in accordance with the apportionments until May at least. There had not been, as many seem to suppose, an agreement todissolve the pool April 1, but two or three companies had given notice of withdrawal on that date, and it, therefore, would not have covered quite all the business. Meanwhile there will be an effort to establish the organization on a footing acceptable to all. The prospect of success in this effort does not now seem very good, though some of those who have been supposed to be least favorable to the combination now seem to be most anxious to have it continued. The fact that another month is taken for consideration indicates that there is hope of effecting something, and we believe that every one concerned fears for the result if the combination shall be wholly abandoned. Things are so bad as they are that a go-as-you-please race for business may not decrease profits much for the time; but the railroad companies know very well that times will come when independent action will still further reduce profits, and that to prevent this and to take advantage of the times which will also come when profits may be largely increased, some kind of co-operation on their part is indispensable. That is, granting that the railroads are not making any more now than if they had no combination, the bad times will last longer, and are more likely to become worse without than with one.

At present the Pennsylvania Railroad Company seems most skeptical of any advantage to be gained by a combination like the present. As its net earnings, and especially those of its western controlled lines, have fallen off largely within a year past, like those of other railroads similarly situated, it is not to be supposed that it is inclined to give up the pool because it finds it can make profit enough on the through business without it, but presumably the fault it finds is that the pool has not effected what it was intended to effect; that in spite of it rates have been irregular and often quite unprofitable, and that rival lines have not kept their agreements, and have been allowed to profit by their fault. If then an arrangement can be made which seems to this company likely to be effective—to secure constantly a moderate profit on the through business and prevent diversions to other railroads such as they could not secure by open competition—presumably it will be acceptable to the Pennsylvania Railroad people.

It seems to be assumed that nothing can be effected toward maintaining rates until something has happened to the West Shore road. There is nothing in the nature of things, however, to prevent a division of the traffic in both directions which shall give the West Shore, as well as the other roads, a share in the business at full rates. The West Shore, we believe, would heartily welcome such an arrangement. It is because it is assumed that the New York Central will not at present consent to an arrangement which will enable the West Shore to do a profitable business, that people think that rates cannot now be restored. Certainly passenger rates cannot be restored fully so long as these two roads carry local passengers at a cent a mile, but it is presumable that the West Shore is as anxious to make a profit on local as on through business. We confess that we shall expect these two roads eventually to be substantially under one management; but that may not come for a long time, and there may be an intermediate state before that condition is reached. But granting that through passengers and freight must continue to go between New York and Buffalo at cost or less, this need not necessarily make the whole traffic worthless. A coöperative organization of the railroads should be effective not only by preventing many evils, but also by limiting as far as possible the bad results of those that it cannot altogether prevent. It does not inevitably follow that when freight is carried for ⅛ cent per ton per mile from Buffalo to New York, it must be carried at the same rate from Memphis to Baltimore, or from St. Louis to Boston. When the steamers were paying a cent a bushel for carrying grain from Boston to Liverpool, the railroads did not take freight free from Chicago to New York; and if there must be an unprofitable rate between New York and Buffalo, and if this must be followed by rates over corresponding portions of trunk lines further north and south, or east of Toronto, Pittsburgh, Wheeling and Parkersburg, it need not be on the great systems of railroads further west extending to Chicago and the Mississippi, which can the less afford it because they have not the enormous local traffic which the Eastern trunk lines enjoy. It has not often been possible to restrict the effects of a railroad war in which an eastern trunk line was a party, but this was because the trunk lines had western connections under their own control, and the contest in fact concerned the traffic of the whole territory. This is not now the case. The West Shore will not earn a dollar more with rates maintained west of Buffalo than if they are down to the Buffalo-New York standard. And if reports are true, all the lines west of Buffalo with which the West Shore can interchange are ready and anxious to insist on rates over their lines as high as they can obtain, which, with the lakes alongside and near their opening, will certainly be low enough, but may still leave some margin of profit. Indeed these roads are already trying to do this with the east-bound passenger traffic, making the Chicago-New York rate equal to the regular Chicago-Buffalo rate added to the reduced Buffalo-New York rate.

But though it seems certain that the harmonious action of the railroads would prevent the sacrifice of the through business west of Buffalo and Pittsburgh, it is by no means certain that such action will be had. To that end it will be necessary for the managers of a large number of railroads west of Buffalo, including several west of Cincinnati and Chicago, to coöperate, and several of them have only a small interest in the business. It seems that the whole matter has been left to them, independently of the trunk lines, except that the western roads controlled by the latter will coöperate. This seems wise; for if the eastern trunk lines cannot prevent the loss of the value of the business over their roads, they may well leave it to the western companies to take care of their own business. The situation is one well calculated to command the attention and involve the pride of the western managers; for if they succeed in regulating a traffic which seems to have been too much for the eastern managers, they will win and deserve great credit. They are to have a meeting April 1, and more seems to be hoped from the action of this meeting than from anything the eastern trunk lines are likely to do at present. It is true that nothing which they can do can make the business very profitable now for some months; but we have to look ahead more than a few months, and at least a few cents of profit per hundred pounds may be secured, which will be a much needed addition to the income of most of the roads, and without some agreement it is doubtful if any profit whatever can be had from the great bulk of the through traffic.

LIGHT RAILROADS.

Granting the truth of what was said in an article on "Light Rails," in a recent issue (Feb. 6), that light railroads, as a whole, do not prosper nor multiply, or if they prosper do not stay light, and that one great reason for this is that in the purchase of rails of light section, which is often one of the first and chief directions in which economy is sought, there is a ruinous sacrifice of value, it is obvious that there must be another side to the question. The conclusion to which our results seemed to point, that it was not worth while to build light railroads, and that they could not reasonably be expected to prosper, is evidently in part at least fallacious; for there is evident need at many points for just such lines which, when built, do prosper, or at least answer the requirements. It is, therefore, instructive to consider what are the conditions for success in such lines, and in what direction and within what limits it is expedient to economize in their construction. That it is *not* expedient to make an onslaught in the first instance on the rail-section and cut it down to the supposed limits of our purse may be considered indeed to have been established by the facts presented, for it is reasonably certain that if a saving in immediate outlay had to be so dearly purchased in every instance, the result would be simply ruinous.

Fortunately, it is not so necessary. If we examine in detail the cost of even a moderately important line, we shall find that an enormous proportion of it is for items which a light, cheap railroad either has no use at all for or can dispense with, in part or whole, at slight inconvenience, or can postpone at moderate sacrifice to some indefinite date in the future. Terminal facilities, for instance, are an immense item in the investment in large railroads. In the Buffalo yards alone there are, or soon will be, 650 *miles* of track, representing an investment of millions. Station and other buildings are other large items which may be made small on a light road, but the chief of all directions in which a rigid yet intelligent economy may be exercised to reduce largely the construction account without undue effect upon earning capacity, is in the construction of the road to sub-grade.

This is best seen by considering how much (or rather how little) the cost of 5 lbs. per yard extra weight in the rail, which at the even figure of $30 per ton we have taken at $240 per mile, will do to construct the road to sub-grade. We have seen how very advantageous is the effect of this expenditure upon the rail-section. If expended on grading and masonry, the same amount will only do the following:

Earthwork, at 20 cents per cubic yard.....1,200 cu. yds.
Equal to a continuous fill 5 in. deep, or a cut 10 ft. deep and 100 ft. long.
Rock cutting, at $1.50 per cubic yard..... 160 cu. yds.
Equal to a cut 100 ft. long and 23 ft. deep.
Culvert masonry, at $5 per cubic yard..... 48 cu. yds.
Or one small box culvert.
Bridge masonry, at $10 per cubic yard.....only 24 cu. yds.

Far more than these quantities can usually be saved by abandoning the attempt to fit the line for high speed and long trains and judiciously economizing in these three ways: (1) by using sharp curvature; (2) by using trestling in place of masonry and heavy earthwork; (3) by moderate undulations of grade; to which may be added (4) sacrifice of distance to obtain easy work and especially to reach towns.

Without now entering into the vexed question of the proper standard of curvature for lines of fair traffic, it is certain that for a road to which the last degree of economy in first cost is essential, and which does not expect more than a very light traffic, the intelligent use of sharp curvature offers one of the simplest most effective and most expedient methods of economizing in first cost. Since the introduction of steel rails and air brakes, both the operating cost and the danger of sharp curvature have been greatly diminished. The New York elevated railroads run 800 or more trains of four cars each per day around 63-degree curves (90 and 100 ft. radius) with perfect ease and with only a moderate slackening of speed. Another curve of 50 ft. radius was used on the main line of the United States Military Railroad, at Petersburg, Va. (standard gauge), over which "a very large traffic (hauled by locomotives of ordinary type) passed for months afterward, supplying the armies about Richmond and other points to the southward, and no accident or trouble whatever was experienced at the point in question." In the *Railroad Gazette* of Oct. 4, 1878, and Oct. 12, 1879, full details were given of other sharp curves in use on standard-gauge lines, ranging from 410 to 175 ft. radius, over many of which a very heavy traffic passes. While these extremes are to be deprecated (nor are they often required), they do make it an absurdity to say that a cheap light-traffic railroad may not use almost any curvature which the nature of its route calls for in order to reduce first cost, whatever its gauge.

In a country offering any difficulty, the reduction which can be effected in this way is very large indeed, and it will in general be found that no excessive reduction of radius is needed to give a line closely approximating to a surface line, and fitting so well that any further reduction of radius will save but little. Thus in the very roughest and most rugged country, a radius of 300 to 350 ft. reduces the cost enormously below that resulting from a radius of 500 or 600 ft., while a reduction to 250 or 300 ft. adds little to the saving. In more moderate and ordinary country, a 10 or 12-degree curve (573 to 478

ft. radius) furnishes a similar expedient minimum, while in very easy country a still larger minimum may answer every requirement, the law holding with singular uniformity (for such a seemingly lawless thing as topography) that some one given minimum will "fit the ground" best for considerable distances, so long as the general character of the topography remains the same.

Moreover, if the profile of almost any line be studied it will be found that the expenditures are largely concentrated at single points. Four or five cuts in the mile, 8 or 10 miles in a division, are what bring up the average, so that in seeking the last degree of economy at these critical points, the line *as a whole* is not, after all, so seriously modified as would be imagined. A further advantage, or, rather, a bright side to the disadvantage, of so economizing by sharp curvature, is that at many points the works may assume a mere temporary character for present necessities while being adapted for ready improvement in the future, when and *if* means exist for doing so. In this way the necessities of both the present and future are better provided for than if a compromise line were chosen in the beginning which did not fully insure either present cheapness or future excellence.

What the precise effect is of a difference of gauge on curve resistance (and in fact, of all other modifying conditions) is still a matter of doubt, but theory and experience combine to indicate that, all other conditions remaining the same, the curve resistance is directly as $\sqrt{gauge^2 + length\ of\ wheel\text{-}base^2}$; from which it follows that a reduction of either the gauge or length of wheel-base *alone* will not materially modify the resistance, but if both be reduced together, so that the rectangle of the wheel-base remains always "similar," the curve resistance may vary very nearly as the gauge. Approximately, this condition obtains with standard and narrow-gauge rolling stock as now designed, but whether or not practical conditions make it necessary or expedient that it should be so, so that it is a legitimate, instead of merely accidental, advantage of the narrow-gauge rolling stock, it is profitless to inquire, because the *direct* loss of power and wear and tear from curve resistance is comparatively a trifling matter, and any assumed difference in hauling capacity (which is not often a very serious consideration, however, for light-traffic roads) may be easily compensated for by a slight increase in the rate of compensation for curvature, an increase which will have far too trifling an effect on the average gradient to make any measurable difference in the location or profile. As respects facility or possibility of running trains around curves of any given radius, there is absolutely no practical difference between the two gauges. A standard-gauge engine of the *same weight, cost and power*, has enough shorter wheel-base to make it, in fact, a little easier to pass around sharp curves. It is unnecessary to enter again or more fully, however, into the gauge question, on which the position of this journal is well known. By either gauge it is both possible and expedient to use any radius of curvature which the ground really requires.

The best existing experimental evidence on the theoretical effect of gauge is perhaps some delicate experiments on models made some years ago by Mr. Reuben Wells, then Master Mechanic of the Jeffersonville, Madison & Indianapolis Railroad, and now General Manager of the Louisville & Nashville Railroad,* which for some reason have attracted less attention than their merit deserves.

The free use of wooden trestling and the practical abandonment of the (immediate) use of masonry is another legitimate and wise device for reducing first cost.

It is the fashion among some engineers to decry the use of wooden trestles, nor can it be denied that they are often ill and dangerously built, and then neglected so long that they become a frequent source of accident. But when properly built and properly kept up, they furnish a safe and cheap method of avoiding or postponing the more costly features of construction, so that, even for roads of considerable traffic, it is far wiser to preach the gospel of sound construction than to decry their existence. Fortunately, under existing conditions in this country, most of the localities where very light railroads only can be supported are near enough to local timber supply to obtain pine, hemlock or other suitable trestling timber at very low prices; and with split stringers, sills and caps it is easily possible (without going into fuller details for which we cannot now take space) to erect substantial structures, without mortices, in which each individual stick is renewable in detail, and which will be as safe for the passage of trains as any bridge.

* Sixth Annual Report of the American Railway Master Mechanics' Association, 1873, p. 147.

At somewhere from 10 to 15 ft. of height of fill such a structure becomes cheaper in first cost even than a plain earth fill, and when in addition to the fill there would have to be a masonry structure, or when, if it were not for the trestle, the grade would have to be dropped or the line swung in so as to give a rock (or even heavy earth) cut at each end of it, the trestle becomes very much cheaper, and its free use affords us a solid and safe railroad for immediate use which can be continued in the same form indefinitely, if poverty requires it, or which can be very advantageously and economically replaced by permanent structures at any time, using trains to make the fills and supply the stone.

The use of moderate undulations on gradients affords another means by which the first cost of the line may often be largely reduced, and—if the track is good enough to stand a certain moderate increase of speed at special points—without injury to the hauling capacity of engines. The extent to which momentum can be relied on in this manner is strictly limited, and is too large a subject for present discussion; but with maximum speeds of 20 miles per hour, and an average speed of 15 miles, breaks of five vertical feet in grade lines, properly eased off by connecting gradients, will not prove seriously objectionable, may be taken out at any time, and are a far wiser way of economizing than cutting down the rail so light that it will barely carry the engine.

Finally, one remaining device will complete all that is possible, or probably necessary, in the way of reducing the first cost of the road-bed. A great deal of money is spent on many roads which can ill afford the luxury in getting a short line. We need not now discuss the point at which, or the conditions under which, this ceases to be wise; for however it may be with roads of large or fair traffic, it is unquestionable that a cheap light-traffic railroad which *spends money* to get a short line is burning its candle at both ends, and the engineer of such a line cannot too carefully remember that, although on the one hand its length may be the ruin of it, because it has to operate it, yet on the other hand it is its salvation, because its revenue depends on it. Without now going into the very broad question raised by this statement, it is certain that the *proportion* of the expenses, which varies with the length of the road, is very much less than the proportion of the receipts which so varies, on railroads operated under ordinary conditions.

Moreover, the same wise provision of nature which takes the large rivers past the large towns has usually provided that, in choosing the easiest line regardless of distance we shall not only obtain an easier line to construct, but one which will take us nearer to the various sources of traffic. However it may be with other lines of larger traffic, a *poor* railroad cannot afford to pass by on the other side even quite small traffic points which, by going nearer to them, will add a little more traffic to the slender aggregate; not only because every little helps, but because, in this, as in everything else, "the destruction of the poor is their poverty." Not only is the tributary population smaller, but the revenue *per head* of that population is also smaller; for a brief consideration will show that a road which, instead of having two, has three towns on its line, will have added, in the natural course of events, not simply 50 per cent. to its traffic, but will have doubled it. It is therefore wise to swing its line over to strike such a town, even if the probable addition to the length of its line were an unmixed evil; but we have seen that, on the contrary, it will probably add more to receipts than it will to expenses, and if, as will usually happen, by swinging out to strike the town it has also struck an easier country, a third gain will have resulted, all of which would have been lost by taking the crow for an engineer.

The truths which have been stated are not to be taken "neat" nor recklessly twisted to mean more than has been said, as, for instance, that it is ever expedient to lengthen a line merely for the sake of lengthening it, or that it is not worth while to try to avoid curvature, or that wooden trestles are as good as permanent works. It has been merely intended to show that for a road which must practice the *last degree* of economy, and which has little more than a turnpike traffic, the construction of the road to subgrade is the proper place, and the most hopeful place, for "cutting to the bone," because an amount sufficient to give a decently solid superstructure can usually be saved out of the first construction with far less risk of injury and loss. This is apparent from the following table showing the percentages of the cost to sub-grade of various items on different railroads, all of them of comparatively light (although not the lightest) traffic, and varying in character of work from moderately light to the very heaviest. The prices on all of them were from 25 to 40 per cent. higher than now obtain under favorable conditions; but in each case alike it will be seen how much less injury a saving of $240 per mile in some or all of the items given would *probably* have done to the road than if 5 lbs. per yard were cut off the rail section:

	I.	II.	III.	IV.	V.
Length, miles	60	100	14.5	46	15
Clearing	2.1	.....	0.2	2.0	.....
Grading—Earth	71.0	61.9	51.0	35.1	25.7
Grading—Rock	.....	.....	7.5	.....	50.3
Masonry—Culverts	.....	6.1	11.0	.....	5.4
Masonry—Bridge	.....	13.7	13.5	5.8	9.8
Bridging	.....	2.6	1.2	12.4	1.5
Trestling, etc	14.3	11.7	9.1	31.8	.....
Fencing, etc	12.6	4.6	6.5	12.9	.....
Tunnel	.....	.....	.....	.....	7.3
	100.0	100.0	100.0	100.0	100.0
Total cost per mile	$5,073	$7,490	$18,260	$18,020	$83,854

Character of lines:

I. Chiefly light, with sections of heavy grading; no stonework.

II. Moderately light grading, with sections of heavy; many structures.

III. Side hill line, no surface work; very numerous structures.

IV. Light surface grading, two costly bridges only; much high trestling.

V. One of the costliest sections of mountain line in the United States.

Nothing has been said in the above about gradients, because a *very* light traffic road cannot afford to spend money to obtain lower gradients than careful study of the country will afford at the minimum cost. At any rate, until provision has *first* been made for a substantial and well maintained track, it may be taken as a tolerably safe general rule that the same amount of money expended on track will add far more to the hauling capacity of the line than if expended to reduce gradients.

Cutting the work down in the various ways suggested, with due care to do the minimum of injury to its efficiency, $2,000 to $3,000 per mile may be made to carry a very light railroad through tolerably broken country, and this, of course, under favorable circumstances may be reduced much lower.

The condition to which the Wabash litigation is rapidly coming may be briefly summed up. The Receivers ask the Court to allow them to give up all the unprofitable lines, and the holders of the underlying liens on all the profitable lines are trying to foreclose and get them away from the Receivers. The general mortgage bondholders are therefore very likely to find themselves in the condition of the proverbial man between two stools; unless they are prepared to satisfy the prior mortgages on the profitable lines.

Through west-bound shipments from New York over the trunk lines during the first half of March were just about the same as last year, and a little more than in 1883 or 1881, and were exceeded only in 1882. In February, as we have said heretofore, the shipments were 12 per cent. less than last year, and in January a little less, so that the March movement shows a decided improvement over previous periods.

The outcome of the recent action concerning transcontinental rates seems to be that the regular rates are reduced, though probably not to the level of the actual average rates of the past year or so, which have not always been "regular;" that the trunk lines east of Chicago and St. Louis no longer take a fixed proportion of the transcontinental rate, but take their regular through rates on the Chicago basis, to which the Chicago-San Francisco rate must be added to make the transcontinental rate; and that there is an end to the special rates for "contract" shippers—shippers contracting not to ship any freight around Cape Horn to San Francisco. It probably is not generally known that the trunk lines for a long time have had a certain proportion of the California rate, which was for many years considerably larger than their other through rates; though the rate from New York was sometimes lower than the rate from Chicago on certain freights, as we believe the rate from San Francisco to Chicago is still higher to Chicago than to New York on tea, and perhaps some other freight. The California freight was also divided among the trunk lines in proportions unlike those of the other through freight, and was divided for years before there was any other trunk-line pool. The opening of the Southern Pacific route gave the trunk lines the New York-New Orleans steamers as competitors for this traffic, and rates have become so low that they did not have much to gain by the old arrangement. The traffic is comparatively insignificant, at least that part which goes over the trunk lines is, since the opening of the route *via* New Orleans. The total tons shipped from the four seaboard cities to California over the trunk lines in each of the five years ending with 1883 has been:

1879.	1880.	1881	1882.	1883.
36,364	49,894	61,517	65,833	42,651

In 1883 the effect of the New Orleans route is visible,

and it probably was more rather than less so last year. The California shipments then were 2¼ per cent. of the total trunk line shipments from the seaboard.

February Earnings of the Pennsylvania Railroad.

The gross earnings of the Pennsylvania Railroad last February (all lines west of Pittsburgh and Erie) were smaller than in any corresponding month since 1880, and the net earnings were the smallest since 1878. The decrease from January to February was larger than in any recent year except 1883, but not more than was to be expected in view of the interruptions to shipments by the weather. For 13 successive years the gross and net earnings and working expenses of these lines east of Pittsburgh and Erie in the month of February have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1873	$2,685,295	$2,145,165	$540,130
1874	2,517,980	1,716,581	801,099
1875	2,166,815	1,452,163	714,652
1876	2,345,792	1,881,104	464,688
1877	2,165,699	1,461,646	704,054
1878	2,169,909	2,418,009	744,900
1879	2,538,039	1,365,653	1,172,987
1880	2,644,575	1,712,394	1,232,182
1881	3,095,594	1,937,510	1,158,084
1882	3,306,730	2,227,129	1,079,601
1883	3,712,195	2,375,521	1,336,674
1884	3,428,713	2,304,154	1,124,559
1885	3,077,680	2,247,211	830,469

Compared with last year and 1883 the decreases this year have been:

1884:	Gross earnings.	Expenses.	Net earnings.
Amount	$351,033	$56,943	$294,090
Per cent	9.8	2 5	26.1
1883:			
Amount	$634,515	$128,310	$506,205
Per cent	17.1	5.4	37.9

The decreases, in net earnings especially, are very great, amounting to 0.3 per cent. on the stock compared with last year, and ½ per cent. compared with 1883. In 1883, however, the earnings were the largest they have ever been.

On the lines *west* of Pittsburgh and Erie, the result this year was nearly the same as last year, though these lines suffered most from the snow blockade; but last year, and also in 1883, there were great losses on some of these roads because of the extraordinary floods of the Ohio River. This western system has shown a surplus over or a deficiency in meeting all liabilities in February as follows for seven years past:

1879.	1880.	1881.	1882.	1883.	1884.	1885.
Deficit.	Surplus.	Surplus.	Deficit.	Deficit.	Deficit.	Deficit.
$35,730	$133,243	$165,022	$100,197	$98,526	$145,692	$190,780

Adding the surplus and subtracting the deficit of this system from the net earnings of the Eastern system, we have as the Pennsylvania Railroad Company's profits from both systems:

1879	$1,208,717	1883	$1,238,148
1880	1,365,425	1884	978,867
1881	1,533,106	1885	639,689
1882	979,404		

Thus the profits this year were a third less than in 1884 and 1879, and only about half as great as in the other years.

For the two months ending with February, for 13 successive years, the earnings and expenses of the lines east of Pittsburgh and Erie have been:

Year.	Gross earnings.	Expenses.	Net earnings.
1873	$5,439,579	$3,339,817	$1,090,762
1874	5,375,145	3,454,370	1,925,775
1875	4,457,154	3,082,930	1,374,224
1876	4,793,477	3,562,864	1,230,613
1877	4,549,265	3,117,689	1,431,576
1878	4,559,206	2,936,107	1,623,099
1879	5,081,463	2,888,945	2,192,518
1880	6,028,126	3,429,646	2,598,480
1881	6,284,809	3,919,864	2,364,945
1882	6,680,651	4,526,184	2,153,867
1883	7,641,552	4,833,820	2,807,732
1884	7,000,946	4,710,251	2,290,695
1885	6,353,202	4,532,158	1,821,044

Compared with 1884 and 1883 the decreases this year are:

1884:	Gross earnings.	Expenses.	Net earnings.
Amount	$647,744	$178,093	$469,651
Per cent	9 2	3.8	2.1
1883:			
Amount	$1,288,350	$301,662	$986,688
Per cent	17.0	9.4	35.1

The gross earnings were the smallest since 1881 and the net earnings the smallest since 1878 and smaller than in 1874.

The surplus or deficit of the lines *west* of Pittsburgh and Erie for the two months has been:

1879.	1880.	1881.	1882.	1883.	1884.	1885.
Surplus.	Surplus.	Surplus.	Deficit.	Surplus.	Deficit.	Deficit.
$125,897	$434,070	$546,229	$57,419	$125,274	$256,271	$264,2 0

Adding the surplus to and subtracting the deficit from the net earnings of the eastern system, we have as the company's profits from both systems:

Year.		Year.	
1879	$2,318,415	1883	$2,931,006
1880	3,032,550	1884	2,034,424
1881	2,911,174	1885	1,556,844
1882	2,096,418		

The decease from last year is $477,580, which is a little less than ⅛ per cent. on the present stock; the decrease from 1883 is $1,374,000, or 1⅝ per cent. on the present stock and 1⅝ per cent. on the stock then outstanding. Should the decrease continue at this rate (23½ per cent.) it would amount to about $6,900,000 for the year, which is $340,000 more than the dividends paid last year. The decrease in these two months since 1880 has been enough to pay 2⅛ per cent. on the capital stock then outstanding—but that was an extraordinarily favorable time, traffic being heavy and rates good, and working expenses not yet seriously increased.

The unsatisfactory condition of the leading industries on this road probably has more to do with the great decrease in profits this year than the great reductions in rates on through traffic, though these must have had a considerable effect, especially in earnings from passengers and west-bound freight, the east-bound freight not having yielded much profit last year, and probably none at all in 1882. The unfavorable weather probably prevented a larger decrease in the working expenses, which were considerably larger *per day* in February than in January ($80,258 against $73,772). There has, however, at no time been so large a decrease in these on the Pennsylvania Railroad as on most others that report.

The Locomotive "Decapod."

In giving, in our last issue, a comparative table of some of the leading dimensions of the "Decapod," as compared with other exceptionally large engines, the estimated weights, instead of the actual weights, of the Southern Pacific engine "El Gobernador" were taken. It appears that, as actually built, the engine differed somewhat both in weight and in dimensions from the design.

The following table gives the corrected figures:

Railroad.	Brazil.	Southern Pacific.
Type of engine	Decapod.	El Gobernador.
Weight in working order, lbs	144,000	152,000
Weight on driving wheels, lbs	128,000	121,800
Weight of tender empty, lbs	34,000	50,650
Water, coal and tools, lbs	46,000	35,000
Total weight tender, lbs	80,000	85,650
Total weight engine and tender, lbs	224,000	237,650
Tank capacity, gals	3,500	3,000
Coal capacity, lbs	16,000	10,000
Cylinders, diameter and stroke	22 × 26	21 × 36
Driving wheels diameter, in	45	57
" " number	10	10
Tractive force per lb., av. press. in cylinders, lbs	279.6	278.6
Driving wheel base	16 ft. 11½ in.	19 ft. 7 in.
Engine wheel base	24 ft. 6½ in.	28 ft. 11 in.

It will be seen from this that the "Decapod" has slightly more tractive force, and is slightly lighter than "El Gobernador." There is a singular difference in the tenders. "El Gobernador's" tender is 50 per cent. heavier than that of the "Decapod" but carries less water and coal. This is probably due to the fact that "El Gobernador's" tender has six-wheeled trucks.

One great difference between the two engines is in the size of the wheels. The "Decapod's" wheels are made as small as possible in proportion to the stroke of the pistons, and consequently the saving of weight effected by the smaller wheels and shorter cylinders enables the boiler to be increased to the unprecedented size of 64 in. diameter. The smaller wheels also enable a shorter driving wheel base to be adopted, the large wheels on "El Gobernador" nearly touching one another, though the wheel base is very long. In the "Decapod" there is room for two Westinghouse driver brakes on each side of the engine, and the wheel base is shorter, though still of considerable length for working round sharp curves.

The "Decapod" is the first engine with ten coupled wheels constructed by the Baldwin Locomotive Works for the wide or standard gauge, though two decapods, each weighing 90,000 lbs., have been built for the 3 ft. gauge.

The piston-rod is 4 in. diameter and the main crank-pins are 6 in. diameter. All the coupling-rods have bushed ends. The Laird cross-head is of cast steel and the slide bars are cast iron. The boiler is fed by two long stroke pumps and an injector. The reverse gear is a combination of screw and lever, so that either may be used.

The middle wheel of the coupled wheels takes the main rod. The two hind pairs and the front pair of drivers have flanged tires, but the main drivers and the pair immediately in front of the main drivers have plain tires.

The tender is fitted with a roof over the coal space, and is carried on two four-wheel trucks.

Chicago through freight shipments eastward of flour, grain and provisions for the third week of March showed a further large increase, and were about as large as those made in the first week of the 15-cent rate last year, and much larger than any made at a 20-cent rate, which is supposed to have been firmly adhered to last week. The shipments this year and in corresponding weeks of five previous years have been (the years previous to this including all freight) in tons:

1880.	1881.	1882.	1883.	1884.	1885.
75,439	55,486	38,646	69,368	55,947	75,974

The shipments this year were nearly the same as in 1880, but were a third more than last year, which was the week of the nominal 20-cent rate, which, however, was cut to such an extent that 15 cents was made the regular rate at the end of the week.

For six weeks the shipments and the percentage going by each road have been:

	Week ending—					
Tons:	Feb. 14.	Feb. 21.	Feb. 28.	March 7.	Mar. 14.	Mar. 21
Flour	11,282	8,906	15,549	17 153	20,600	23,753
Grain	30,913	22,887	30,913	36,354	38,989	47,087
Provisions	3,846	8,044	6,706	7,474	7,086	5,134
Total	46,041	39,837	53,168	60,981	66,675	75,974
Per cent.:						
C. & Grand T	6.4	2.0	6.0	10.2	8.2	7.0
Mich. Cen	5.8	15.3	11 0	8.1	14.3	24.6
Lake Shore	26.0	19.7	18.7	17.0	17.1	11.8
Nickel Plate	7.4	7.1	8.2	5.1	7.2	8.0
Ft. Wayne	12.8	20 8	22.5	24.0	20.2	19.3
C., St. L. & P	19.8	10.0	13.8	14.6	10.2	11.7
Balt. & O	6 2	9.0	9.1	7 3	11.1	7.2
Ch. & Atlan	15.6	14.1	10.7	13.7	11.7	9.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

There has thus been a steady increase in the shipments since the second week of February, when the snow blockade was at its height; yet the shipments last week were not as great as in the first week of February, the week before the blockade, when they amounted to 81,375 tons. It is noticeable that the flour shipments were the larger last week, however, by 4,534 tons (23½ per cent.), while the grain shipments fell off 5,044 tons (9¾ per cent.), and the provision shipments no less than 4,891 tons (49 per cent.). The flour shipments last week were really extraordinary. Last year, when under the 15-cent rate the total shipments in some weeks were much larger than they ever have been before or since, the largest flour shipments were but 15,718 tons, and in only two weeks were they as much as 15,000 tons. At this rate, there will be no stocks on hand left for shipment by lake. The stocks of grain in elevators at lake ports are so large, however, that the heaviest shipments cannot make them small by the time the lakes open, unless receipts become very small, and so far they have exceeded the shipments. At Chicago there are about 18,000,000 bushels, at Milwaukee more than 5,000,000, and at Duluth 6,000,000 bushels, and all but about 2,000,000 bushels of corn at Chicago is wheat.

The chief change in percentages last week is a very large increase in the share carried by the Michigan Central, which took something like the percentage common before February. The larger part of the gain came from the Lake Shore and the Baltimore & Ohio, which latter had an unusually large share the week before. The two Pennsylvania roads together carried 31 per cent. of the whole; the three Vanderbilt roads, 45.3 per cent. The Chicago & Grand Trunk, unless over in the live stock and dressed beef pool, seems likely to have a balance due it April 1, when it withdraws.

It must be remembered that the reports now made do not cover all the pool shipments. The total shipments from Chicago in the freight pool during the first 15 days of March were actually 162,903 tons, instead of 127,656 tons, as indicated above.

The amount of the shipments last week was so great and the stocks of grain on hand are so large, that it now seems as if the shipments until navigation opens may be as large at a 20-cent rate as they were last year at the 15-cent rate, and it ought to be easy under such circumstances to maintain the rate. It is not certain that it will be maintained, however. The railroads since the snow blockade have had difficulty in moving all the freight offering, the disturbance by the blockade and the damage to rolling stock then diminishing the cars available, and the extreme cold and snows since reducing the average train-load, and yet the rate has sunk from 25 to 20 cents. With better weather the roads will be able to haul at least as much as they carried last year, and with every one free to make rates to suit himself, there is danger that there may be a further reduction, though, of course, not so much danger as if the offerings were smaller. After navigation opens there will not be this to maintain rates, and it will be surprising if they are kept up to 20 cents then, unless the railroads co-operate to keep them up.

The first railroad in Belgium was built in 1835. To celebrate the jubilee of this event the government proposes to hold this year an international congress of engineers, a historical and allegorical procession, and an exhibition of railroad material, equipment and appliances.

A falsehood, once well established as truth in general belief, dies hard. We find in *Engineering*, in a summary of the "laws of friction," as recently enunciated by a French "eminent electrician" before the Academy of Sciences, the following:

"(2). With dry surfaces the coefficient of friction is independent of the speed, surface and load."

Another eminent French scientist is contending for the honor of having enunciated this great truth thirty years ago.

If there be anything which may be considered to have been thoroughly demonstrated by modern experiments on the friction of brakes and driving-wheels and other similar bodies, as notably by the Galton-Westinghouse experiments, it is that the coefficient of friction varies materially with all three of those conditions, with unlubricated as well as lubricated surfaces, if indeed this be not a fact sufficiently evident from common observation of the behavior of brakes and driving-wheels, unassisted by delicate tests. Yet the old and long-since exploded laws of friction of Morin continually reappear in modern publications, and even when, as in this case, their error is admitted as respects lubricated surfaces, we find them still adhered to in respect to unlubricated.

In justice to M. Morin, however, it should be always remembered that he never claimed or implied that the results of his experiments were as decisive, complete and general as, for some strange reason, they have since been taken to be, although much of what he did assert as fact cannot be reconciled with the indications of more modern and perfect tests.

Dining cars, those important adjuncts of comfortable traveling, seem to be gaining favor in England. Those hitherto running there have been built by Pullman's Palace Car Co. here and shipped across in sections, but the Manchester, Sheffield & Lincolnshire Company has now built one at its works near Manchester. It is 60 ft. long, runs on two six-wheeled trucks, and contains a smoking-room, dining-room, gentlemen's lavatory, ladies' room, kitchen, and conductor's room or pantry. The two latter rooms are lined throughout with asbestos, so as to avoid risk of fire. In other respects the arrangements are similar to those usual in dining cars here, The car is to run between Manchester and London.

Record of New Railroad Construction.

Information of the laying of track on new railroads in the current year is given in the present number of the *Railroad Gazette* as follows:

Fort Worth & Denver.—Extended from Wichita Falls, Tex., north 6 miles.

Old Colony.—A branch is completed from Brockton. Mass., east to South Abington, 5 miles.

This is a total of 11 miles, making 165 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years past has been:

	Miles.		Miles
1885	165	1878	226
1884	334	1877	165
1883	521	1876	304
1882	1,180	1875	129
1881	541	1874	198
1880	975	1873	429
1879	298	1872	642

This statement covers *main track only*, second tracks and sidings not being included.

NEW PUBLICATIONS.

The Coal Trade for 1885: by F. E. Saward. Issued by the *Coal Trade Journal*, New York.

This is the twelfth yearly number of a very useful handbook which gives in a condensed form a great deal of information with regard to the production and distribution of coal in this country, with the range of prices at the chief points of distribution and consumption. The statistics are generally given in a form which makes them convenient for reference, and enables the reader to find what he wants with little labor. The figures for the anthracite coal trade and that of leading Eastern bituminous regions are full and satisfactory. For the great output of bituminous coal west of Pennsylsylvania they are few and incomplete. This is not the fault of the Editor, however, for it is, unfortunately, a very difficult matter to get any reliable statistics of this production, and anything approaching to completeness is out of the question.

As in previous years, Mr. Saward has succeeded in making a manual which is exceedingly convenient for use, and which contains a great deal of information that is nowhere else so accessible.

Catalogue of L. Schutte & Co., Steam Jet Engineers. Philadelphia, 1884.

The tendency of modern industry to separate into specialties is well illustrated in this catalogue, which shows perhaps a hundred or more different uses to which steam jets are or may be applied, and is one of the commendable class which seems designed to convey a little useful knowledge as well as to blow the manufacturers horn. When one considers how "handy" a way the steam jet is for moving liquids and gases, the wonder is, perhaps, that the method is not more rather than less used, even in cases where it necessitates some sacrifice of economy.

Album of Designs for the Phœnix Bridge Company. Philadelphia, J. B. Lippincott & Co.

The 28 plates of this new catalogue, mostly heliotypes, make it by much the most luxurious which has come under our notice. The company says in it that its present capacity is from 30,000 to 35,000 tons per year. An interesting statement giving each single span erected by the company (or by Clark, Reeves & Co., to which it succeeds) shows a total of 370,400 lineal feet, or about 70 miles, with some 8 acres of iron roofs and ocean piers. A short and very general specification follows, and a valuable plate giving maximum wheel loads of various engines and cars, with their distances apart. The detailed descriptions of the designs which follow have an air of being framed to "tell just enough and not too much," but no doubt have their value also.

Foreign Railroad Notes.

On the Rohilkund & Kumon Railroad, in India, the fare for a distance of 67 miles is 12 rupees first-class and only 1 rupee third-class, there being no second-class—about $4.80 and 40 cents (gold) respectively. Probably nowhere else in the world is the difference in fare by the two classes so great. The charge for a horse is $5.02 for the 67 miles—more than the first-class fare; for a dog it is 30 cents.

The adoption of some means of signaling the locomotive from the compartments of passenger trains has been for several years the subject of government attention in France. After July 1, 1885, it is to be made compulsory on all express trains. Most of the companies use an electric communication (Prud'homme's system), while the Northern Company uses a pneumatic arrangement connected with its Westinghouse brakes—similar, doubtless, to what Mr. Westinghouse is now introducing in this country.

In Prussia, all express trains are to be provided with such means of communication before the close of the current year, and all other passenger trains within a year more. The Prussian roads simply use a cord, running outside and just above the level of the window. This cord is to be connected with the locomotive whistle for giving the signal.

The Arlberg Railroad from Innsbruck to Bludenz is 84 miles in length. The total cost was about $17,000,000, or $200,000 per mile. About half of this ($8,300,000) was spent on the tunnel, 6⅛ miles in length, making the average cost of the rest of the road about $112,000 per mile. This expense was necessitated by nine minor tunnels, and four important bridges. The longest of the bridges was that over the Patzuoun valley at Wiesberg, with about 400 ft. span. The great tunnel itself has been often described. Its eastern extremity is 4,272 ft. above sea level. Thence it rises with a grade of 2 in 1,000 for two miles and a half, and falls nearly four miles with a grade of 15 in 1,000. The western extremity is 3,991 ft. above sea level.

The Construction of Locomotives.

The following is an abstract of an interesting paper read by Mr. William Stroudley, Locomotive Superintendent of the London, Brighton & South Coast Railway, before the Institution of Civil Engineers, at a recent meeting in London. Mr. Stroudley's practice differs somewhat from that of other English engineers, especially in using pumps instead of injectors, and in making large driving-wheels the front wheels of passenger engines. The details and general features of Mr. Stroudley's engines have been already fully illustrated in these pages:*

The author, in 1870, designed a large goods [freight] engine, all the principle parts being interchangeable with those on engines for other purposes. Experience with both outside and inside cylinders led him to prefer the latter, and by placing the crank-pins for the outside rods on the same side of the axle as the inside crank (the outside pin, however, having a shorter stroke), the advantages of both systems being thus obtained. In four-coupled engines, he placed the coupled wheels in front, instead of at the back as usual, which permitted the use of small trailing wheels, lightly weighted, and a short outside coupling-rod for the fast running engines, and a larger boiler than could be obtained when the coupled wheels were at the back. A high centre of gravity made the engine travel more easily upon the road, and more safely at high speeds; the slight rolling motion, caused by the irregularities of the road, having a much less disturbing influence than the violent lateral oscillation peculiar to engines with a low centre of gravity. The high centre of gravity also threw the greatest weight upon the outside or guiding wheel when passing round curves; and this relieved the inner wheels, and enabled them to slip readily. The author used six wheels in preference to a truck for these engines, to avoid complication and unnecessary weight. The engines were very light for their power. Spiral springs were used for the middle axle, and these had a greater range than the end ones for the same weight. The two cylinders of the large engines were cast in one piece, with the valves placed below, giving lightness, closeness of centres, and easy exhaust and steam passages. The crank-axle was the only disadvantage left in an inside cylinder, inside-framed engine, and, when this was of good proportions, it offered but a small objection. The standard gauge did not give sufficient width for a strong crank-axle. When the flanges of the driving-wheels were turned down thin, so as to avoid the side-shock given by frogs and check-rails, there only remained the strain of the steam upon the pistons to cause breakage. The deflection, if sufficient, caused a crack at the weakest place, which gradually extended until fracture took place. This was precisely what occurred in the axle; the crack invariably commencing on the side of the axle opposite to that to which the steam was applied.

The separate parts of locomotives, including tires, axles, piston rods, side rods, bolts, cotters and carriage and wagon axles, broke from the same cause; they did not break when carefully designed, and made with proper materials and workmanship. As the crank-axle could not be made of the proper strength, it was well to consider how to avoid, as far as possible, risk of accident by its failure. By making the axle-boxes and horn-blocks deep and strong, giving large flat surfaces against the boss of the wheel and the outside of the crank-arm, the driving-wheel was kept in position after the axle was broken, if the fracture occurred in the usual place, namely, through the inside web near the crank-pin, or through the centre part where it joined the inside web. An axle, broken in this manner would run safely over any part of the road, except at a frog where the guiding rail was lost, and the flange was liable to take the wrong side of the next switch.

The engines had been arranged that part of the exhaust steam might be turned into the tender or tanks, so that the feed water might be heated. This was a special advantage in a tank engine, by increasing the total quantity of water; it also kept the water supply of greater purity, and it relieved the boiler of a certain amount of duty in heating the water from the ordinary temperature to that which feed-water required. The feed pumps had been designed to meet the requirements of pumping hot feed-water.

The proportions of the valve gear gave an admission of 78 per cent. of steam in full gear, which could be reduced to 12 per cent. with excellent results; and as at high speeds the steam was never exhausted, the temperature of the cylinder was maintained, and as much steam was locked up in the cylinders as raised the pressure at the end of the stroke to near that in the steam chest. This made the engine run very smoothly at high speeds and turned what would otherwise be an extravagant coal burner into an economical machine. And for the same reason the compounding of fast passenger or frequent-stopping locomotives was not likely to show much, if any, economy over a well-designed, simple engine. The case was different, however, in heavy freight engines, working with a late cut-off most of the time, and where the conditions approximated closely to those of a land or marine engine with a constant load. The back pressure observed in the diagrams of the high-speed locomotives was not therefore a defect, but an advantage, and the author accordingly used small steam-ports and short travel of slide-valve. These remarks as to back pressure did not apply to the pressure in the exhaust pipes, where it should be as small as possible, but only to the back pressure in the cylinder. The latter was greatest at high speeds, when a small volume of steam was passing through the cylinders, and small power was required, and least when working full power with the smallest expansion.

All the passenger engines and many of the goods engines were fitted with the Westinghouse automatic air brake, as were also the whole of the carriages. The brake gave entire satisfaction and complete control of the trains. The author took considerable pains with the fittings and details when it was first introduced, and arranged the gear for the engines, so that the brake acted upon each wheel independently, allowing the springs freedom to act; or it acted upon the front of all the wheels, as in the tank engines, the brake of which was moved by hand as well as by the air pressure. The Westinghouse air pump had been fitted with a plunger at the bottom end of the rod, 1¾ in. in diameter, and this pumped water into the boilers of the freight engines when they were in sidings or were delayed by signals.

For the express and large freight engines, the greatest possible amount of heating surface had been provided; the fire-box was capacious, with small tubes of considerable length in proportion to their diameter, little or no flame being generated with the coal used, and a very small amount of soot. The fuel which was found cheapest to consume in this locality, was smokeless coal from South Wales, mixed with a small quantity of bituminous coal from Derbyshire. The boilers were made of the best Yorkshire iron, with plates having planed edges; holes were drilled after the plates had been bent; the joints were butt-joints, and they were hand riveted.

The average consumption of fuel of the whole of the engines on the line for the half-year ending June 30, 1884, was 29.74 lbs. per engine mile, including the coal used in raising steam. A great number of careful tests had been made of the amount of coal required to raise steam in the engines from cold water, and also from the partially-heated water when the boiler had not been emptied, and this amounted on an average to about 3 lbs. per mile run. Some doubt had been expressed as to the value of heating feed-water by the exhaust steam. Tests made with the ordinary heating apparatus removed, and water fed to the boilers by the feed pumps, and in one series by a Borland's injector, showed that the amount of power required to work the pumps was inappreciable, and the heated feed-water brought about reduction in the consumption of fuel to the extent of over 2½ lbs. per train-mile. Heating the feed-water by direct contact of the steam did not, on this railway, injuriously affect the boiler plates. With a view to ascertain what was the amount of power required to haul a train from Brighton to London, a complete set of 49 diagrams was taken from the engine Gladstone, working an express train of 23 vehicles, the total weight of train and engine being 752,000 lbs., and the result giving the horse-power at about every mile. The temperature of the gases in the smoke-box was taken at frequent intervals; also the degree of vacuum in the fire-box and in the smoke-box, and the quantity of water used out of the tender. To the latter had to be added the water condensed from the exhaust, which, from experiments, the author estimated at 20 per cent. This gave an evaporation of 12.95 lbs. of water per 1 lb. of coal, and 1 lb. of coal would convey one ton weight of the train 13½ miles, at an average speed of 43.38 miles per hour, over the Brighton Railway, the rate of consumption being 2.03 lbs. of coal per horse-power per hour.

* See *Railroad Gazette*, Jan. 27, 1882, pages 51, 52, 58, and Feb. 3, 1882, pages 66, 67. The boiler was illustrated in the *Railroad Gazette* of Nov. 3, 1883, page 724.

THE SCRAP HEAP.

Employes Aggrieved, Should Apply to the Court

A Washington dispatch says that United States Circuit Judge Brewer, in passing sentence on Doolittle and Schaubacher, the Wabash strikers arrested at Hannibal, Mo., last week, established a precedent that will be of interest to the employés of railroads in the hands of receivers. He said the men should have sought redress by application to the Court. If their grievance was real, the Court would order the receivers to see that it was remedied. In other words, if the men in the employ of a corporation controlled by the United States Court had their wages reduced by the managers of the corporation, the men could cite the managers to appear before the Court and show cause for their action. If the Court thought such action was unjust, an order would be issued prohibiting the change of the wages schedule.

Keely Surpassed.

At one of the fairs of the Massachusetts Charitable Mechanics' Association in Boston, the management forbade any fires in the building; and, as a consequence exhibitors of portable engines considered that they were deprived of opportunities of showing the operation of their class of engines. One exhibitor showed resources equal to the occasion, for he connected the exhaust pipe of one engine in his exhibit to the boiler of another of his engines, removed the safety valve, and connected the flywheel by belting to the shaft which was kept in motion by the main engine of the Exhibition. This method of driving an engine furnished a supply of compressed air in the second boiler, whence it was used for motive purposes. Soon the manager learned that these portable engines were in operation, and assuming that the regulations concerning fire were necessarily violated, sent a worthy colored messenger to examine and report the facts to him. After looking these engines over very carefully, he reported that they were running the engines in question with the "northwest wind or something or other." A group of laborers were examining the engine, and one of them gave his opinion that "cold steam and no fire was the greatest invention yet."

Railroad Young Men's Christian Association.

The Association at Port Henry, N. Y., reports for February 20 religious meetings held, with a total attendance of 574. The classes in vocal music, telegraphy and short-hand were well attended. One entertainment was given, 211 business calls made and 27 visits to homes or to the sick. There were 73 papers and 5 libraries distributed. The work of the association is generally prosperous.

There are now 14 active railroad associations in the state of New York.

The Engineer's Story of a Brakeman.

"Seveal years ago I was running a fast express. One night we were three hours behind time, and if there's anything in the world I hate, it's to finish a run behind schedule. These grade crossings of one-horse roads are nuisances to the trunk lines, and we had a habit of failing to stop, merely slacking up for 'em. At one crossing I had never seen a train at that time of night, and so I rounded the curve out of the cut at full tilt. I was astonished to see that a freight train was standing right over the crossing, evidently intending to put a few cars on our switch. I gave the danger whistle, and tried to stop my train, but had seven heavy sleepers on, and we just slid down that grade, spite of everything I could do. Quicker than I can tell you, the brakeman of that freight train uncoupled a car just back of our crossing, and signaled his engineer to go ahead, which he did sharply, but barely in time to let us through. In fact, the pilot of my engine took the buffer off the rear car. Through that little hole we slipped, and lives and property were saved. Now, that brakeman was only a common railroader, yet he saw that situation at a glance. There wasn't time to run his whole train off the crossing nor even half of it—barely time to pull up one car length by prompt, quick work. He kept his wits about him as, I venture to say, not one man in a thousand would have done, and saved my reputation if not my life. He is now a division superintendent of one of the best roads in this country."—*Chicago Herald.*

A Valuable Train.

Perhaps the richest train that has passed over any road in this part of the country was that which went over the Hannibal & St. Joe one day last week. The train was composed of two cars of gold bullion, three cars of silver, eight cars of silk, and four cars of tea. The gold and silver were from Colorado, destined to the Philadelphia Mint. The silk and tea were from California, going to New York.—*Cameron (Mo.) Vindicator.*

Growth in the West.

The following story of an engineer on a Western railway shows how fast the country is growing. We do not hold ourselves responsible for the truth of the story, but we do not hesitate to say that it is "not much of a story," compared with that told by the Western man who makes an effort:

"One day I was driving my engine over the prairie at the rate of 40 miles an hour, without a house in sight, and supposing the nearest town to be 30 miles distant. But as I glanced ahead I was astonished to see that I was approaching a large city. I rubbed my eyes, thinking it was a mirage.

"'Jim,' says I to the fireman, 'what's this place?'

"'Blamed if I know!' says Jim, staring out of the cab. 'I declare if there ain't a new town growed up here since we went over the line yesterday!'

"'I believe you are right, Jim. Ring the bell or we shall run over somebody!'

"So I slowed up and we pulled into a large depot, where more'n 500 people were waiting to see the first train come into the place. The conductor learned the name of the town, put it down on the schedule, and we went on.

"'Jim,' says I, as we pulled out, 'keep your eyes open for new towns. First thing you know we'll be runnin' by some strange place.'

"'That's so!' says Jim. 'An' hadn't we better git one of the brakemen to watch out on the rear platform for towns that spring up after the engine gets by?'"—*Providence News.*

A Runaway Locomotive.

A gentleman who was in the city yesterday, from Rome, tells an interesting story of the collision which was mentioned in the telegraphic columns of the *Constitution*, a day or two ago, as having occurred on the Selma, Rome & Dalton Railroad. An engineer was running a switch engine between the junction and East Rome when he encountered a train ap-

proaching. He was moving too rapidly to stop, and reversing his engine, jumped off. The engines went together with a crash, but were uninjured beyond the smashing of the cow-catchers. As soon as the switch engine steadied she began to back, as the engineer had reversed her. Being light, she moved off quickly before the engineer could get on, and in a moment the astonished man of the throttle saw his machine whizzing out of sight in the direction of Selma. Six miles out an engineer of a northbound freight saw the runaway engine bearing down on him, flying down a steep grade with a full head of steam on, and making about 50 miles an hour. He reversed and sprang from his engine, saving his life, but receiving some painful bruises. Thus three engines were damaged. The engineer of the switch engine was dumbfounded by the freak of his engine.—*Atlanta (Ga.) Constitution, March* 17.

A Brakeman's "Accident."

Roy Souter was a freight brakeman on the C., B. & Q. As he was going into Creston he took hold of a brake wheel, the wheel flew off, and his force of motion threw him to the ground and from this fall he received injuries that were severe. When suit for damages was talked of an investigation showed that the loose wheel was a racket that he had played on two other roads of which he had recovered $1,500 damages. He would take off the wheel, throw it to the ground, and then jump after it, receiving just enough injury to make out a case. Souter is said to be a cute one, and this is is the fourth "accident" of the kind.—*Galesburg (Ill.) Plaindealer.*

A Long Train.

The longest train ever seen on the Lehigh Valley road was noted a few days ago. It consisted of 129 eight-wheel coal cars, all loaded, and was drawn by a single engine.

A Gas Explosion.

The rear passenger car of a Lehigh Valley train was set on fire on the evening of March 24 by an explosion of gas in the closet at the rear end of the car. The train left the Pennsylvania Railroad station in Jersey City at 6 o'clock, and as it was going through the Bergen cut the passengers in the last car were startled by a loud explosion. Turning their heads they saw that the woodwork of the closet had been rent by the force of the explosion, and fire and smoke poured out through every crack. Almost before they could leave their seats, escaping gas and flame carried fire into every part of the car. The passengers made a break for the front door, panic stricken and in confusion, but all managed to make their escape without serious injury into the car ahead, Some were bruised by being jostled roughly against the seats on their way out, and one of the crowd, who leaped over the backs of the seats, fell and was cut about the head, but the others escaped unhurt. The engineer was notified, and the train moved to a switch a little distance ahead. There the now blazing car was backed off upon a siding, and given over to the flames. The explosion was caused by the bursting of the retort in which the gas with which the car was lighted was stored, but beyond that nothing is known of its origin. It is conjectured, however, that the retort was subjected to more pressure than it was made to stand. The loss will not exceed $1,500.

Low Railroad Bridges.

Judge Churchill, of Boston, in his decision in the inquest concerning the death of William W. Lord, a brakeman on the Eastern Railroad, who was knocked from the top of a car on March 13 by coming in contact with a bridge near Revere, after reviewing the circumstances, says: "His death adds another to the list of deaths caused by leaving a narrow space of only a few feet between the top of freight cars on railroads and bridges constructed overhead, obliging railroad employés to be constantly on the alert to protect themselves by lying flat or crouching down upon the roof of cars where their duty calls them. This is likely to be a frequent source of the loss of valuable life in the future as it has been in the past. Death may be said to have resulted in this case from a faulty system of bridge construction, coupled with the lack of such a degree of vigilance as men seldom possess."

TECHNICAL.

Locomotive Building.

The Manchester Locomotive Works in Manchester, N. H., are building two heavy passenger engines for the Fitchburg Railroad.

It is reported that the Rogers Locomotive Works in Paterson, N. J., have recently received several orders from Southern roads.

The Car Shops.

The Michigan Car Co. in Detroit, Mich., is building 50 refrigerator cars for the Chicago, Milwaukee & St. Paul, 150 refrigerator cars for Armour & Co., of Chicago, and 150 freight and coal cars for the Atchison, Topeka & Santa Fe road.

The Missouri Car & Foundry Co. in St. Louis is running its foundry in St. Louis on some contracts for car-wheels. The car shops are running chiefly on repair work.

The Grand Trunk car shops at Point St. Charles, Montreal, are building several immigrant sleeping cars. The interior woodwork is ash, nicely finished and decorated, and the arrangements for water, light and heat are excellent. The seats are so contrived that they may be turned into sleeping berths at night, while overhead the arrangements are after the fashion of the Pullman cars, but bare, the immigrants being expected to provide bedding.

The Latrobe Car-Works, at Latrobe, Pa., have resumed work, having received an order for cars.

Pardee, Snyder & Co., at Watsontown, Pa., have received a large order for freight cars, and the shops will be started up on full time.

Bridge Notes.

The Morse Bridge Co. in Youngstown, O., has just completed an iron bridge over the Conemaugh River at Coketon, Pa. It is 472 ft. long.

Stupp Brothers in St. Louis have fitted up a bridge shop adjoining their machine shops. They are now building an iron bridge for Forest Park in that city.

Iron and Steel.

The Missouri Furnace Co. has put one of its furnaces in St. Louis into blast. The furnace has been rebuilt while idle.

St. Charles Furnace at Columbia, Pa., is in blast. The wages of the men have been reduced 10 per cent.

The Crawford Iron & Steel Co. will soon put its Neshannock Furnace in New Castle, Pa., into blast.

The Montour Iron & Steel Co., in Danville, Pa., is running on an order for fish-plates for the Philadelphia & Reading road.

Baird Furnace at Gove, O., is to go into blast early in April.

The Albany & Rensselaer Steel and Iron Co. will, it is said, build a new blast furnace in Troy, N. Y. The rail mill in Troy is running on an order for 80-lb. steel rails for the New York Central.

It is authoritatively stated that the South Chicago Rolling Mill of the North Chicago Rolling Mill Co. will start up the first week in April, an agreement as to wages having been reached. The wages are to be adjusted according to a sliding scale dependent upon the market, and the furnaces are to be worked by two shifts of 12 hours each, instead of three shifts of 8 hours each, as heretofore. About 1,800 men will begin work. Preparations are to begin at once for the start-up.—*Industrial World.*

The Miller Forge, in Pittsburgh, recently made a steel crank-shaft for the United States steamship "Nipsic." The shaft weighs 8,500 lbs., and was forged from an 8-ton ingot.

Manufacturing and Business.

The Globe File Works in St. Louis have orders on hand for four months ahead, and report a good demand for files, although prices are very low.

The Niles Tool Works, representing the Gordon & Maxwell Co., of Hamilton, O., and the Morgan Engineering Co., of Alliance, O., will, about April 1, remove their offices and stock of machinery from Hamilton, O., to a convenient and extensive building at No. 713 Chestnut street, Philadelphia, where their business will be conducted hereafter.

The Rail Market.

Steel Rails.—Quotations continue about $27.50@$28 per ton at mill for small lots, with a fair demand. The Louisville & Nashville last week placed an order for 20,000 tons, which is said to have been taken at $27. Some large orders are still on the market.

Rail Fastenings.—Quotations are still nominally 1.90@2 cents per pound for spikes in Pittsburgh; 2.25@2.60 for track-bolts and 1.65@1.75 cents for splice-bars. The market continues dull, with few orders.

Old Rails.—Old iron rails are quoted at $17.50@$18.50 per ton at tidewater, with very few sales. Old steel rails, $16@$17 per ton in Pittsburgh.

Engineers' Club of Philadelphia.

A business meeting was held at the rooms in Philadelphia, March 7, Past President Lewis M. Haupt in the chair; 50 members present.

The tellers of election reported that the following gentlemen had been elected active members of the Club: A. W. Sims, Percy T. Osborne, A. H. Storrs, Wm. O. Dunbar, Morris P. Janney, John W. Henderson, Arthur H. Howland, P. D. Ford and J. H. Nichol.

The resignations from active membership of Messrs. Lloyd Bankson and J. M. Rudiger, Jr., were read and accepted.

Mr. William Wharton, Jr., read a comprehensive paper on the Construction of Street Railways in the United States, and exhibited, in connection with the same, a number of varieties of street rails used in different cities on straight tracks and on curves; also the usual method of construction with wooden ties and wooden stringers, and the Johnson system and the Brayton system of street railway construction, in both of which the use of wood is entirely dispensed with.

He showed, by the working of a model, the system of transferring cars on the six tracks of the Brooklyn City Railroad Company, at their terminus near the east end of the New York & Brooklyn Bridge, designed by him some two years ago. The moving of the cars from one track to another is automatically effected by gravity alone. The car moves down grade on to a truck, which latter is started by the weight of the car down an inclined plane at right angles to the line of car tracks, and stops opposite the track upon which it is desired to shift the car. After being relieved of the car, the truck returns, by action of counterweight, to its original position, and is ready for the next shift.

Mr. C. G. Darrach submitted his informal discussion of the Repairs to Chestnut Street Bridge, Philadelphia, which he had offered at a previous meeting, but which he had desired to be withheld from the minutes until Mr. Titlow's paper was presented. Mr. Darrach said:

"Relative to the article in the *Railroad Gazette* on the repairs to the western abutment of the Chestnut Street Bridge, to which our attention has been called by Mr. d'Invilliers, I would state that there are some errors, as well as some omissions, in the description of the failure.

"1. The west abutment of the 53-foot span is at present concave, and not straight as shown.

"2. A very decided crack or break in the retaining wall on the south has developed next to the buttress. This crack runs from o under the coping to 5 in. in width at a level with the sprung line of the arch, and is nearly parallel with the face of the end of the abutment, *showing clearly that the masonry has been forced eastwardly.* The width of this crack corresponds with the shortening of the span.

"3. The crack in the soffit of the arch is wider at the springing line than near the crown, showing that the abutment has spread.

"These points of failure show that the end foundations of the ends of the abutment have been pushed to the northeast and southeast. In addition, the bed of the skewback on the south end is badly crushed. The stones in the abutment under the skewback are badly spalled under the *rear* of the skewback.

"In the absence of absolute measurement from a *fixed* point, I am not prepared to say that there has been no movement of the abutment of the iron span westward, as the failure of the west abutment of the 53 ft. arch would relieve the pressure exerted by its arch against the 60 ft. arch and the abutment of the iron span, allowing the thrust of the iron span to act against its abutment supported only on piles driven in the mud.

"I am convinced that the *first cause* of the trouble is in the foundations of the western abutment of the 53 ft. span; and also that, while the repairs now being made will counteract a tendency of movement in the abutment of the iron span westward, they are only good as a precautionary measure in view of the repairs which have not been finished, and in fact hardly begun."

Mr. Geo. S. Strong presented some notes upon recent Locomotive Construction, showing blackboard sketches of indicator cards.

Messrs. James R. McClure, Joseph Johnson and John H. Dye, Chairman, the Committee on Memorial of Mr. D. Hudson Shedaker, late member, presented a sketch of his life and professional labors. He had occupied many prominent positions; one of the principal of which was that of Surveyor and Regulator of the important Third Survey District of Philadelphia, which embraces the old city proper.

Experience with the Westinghouse Freight Brake.

Mr. A. N. Towne, General Manager of the Central Pacific Railroad, has written the following letter relative to the working of the Westinghouse brake on the Central and Southern Pacific systems. All, or nearly all, their freight stock is now equipped with this brake:

"Referring to our experience with the brake, when it was being put upon our cars it was a question in the minds of some as to how the brake would work on the mountain sections of our Central and Southern Pacific systems, on 10 degree curves and heavy grades (116 ft. to the mile); but experience satisfies all that the working of the brake on the most difficult portions of the line, between Rocklin station and the summit, 83 miles, where the total ascending grades are 6,821 ft., is quite as satisfactory as on the level portions of the line. We cross the Sierra Nevada range of mountains with both the Central and Southern systems; on the former line the sum total of the ascending and descending grades, on that portion of the main line between Rocklin and Ogden, 721 miles, is 22,791 ft.; and there is about the same kind of gradients on the Southern system.

"As soon as a sufficient number of our freight cars and engines were equipped with the brake, we commenced its use on trains carrying through traffic. Many times it was necessary to put into the train cars not fitted with the automatic, which in some cases slightly interfered with the control of the train by the engineer; but as more cars were equipped from time to time, the better and more satisfactory were the results, until now we have 9,000 cars, or nearly all of our stock, fitted with the brake, giving good satisfaction; scarcely a week passes but we hear of the use and application of the brake preventing casualties. The trainmen all express themselves as feeling a greater degree of safety since the introduction of the brake, and our engineers are now up to a high standard of perfection in handling it, which makes it all we desire—in fact, it is a success beyond all question of doubt, and of such importance in the economical handling of traffic that, in my opinion, formed after the most careful observation, no company can well afford to be without it. This improvement, in its application to freight cars, is as necessary, and, in many cases coming under our observation, more important, than when its principles were first applied to passenger stock."

The Westinghouse Co. reports that the Central Pacific was the first company which equipped all of its freight cars; that the Union Pacific, the Atchison, Topeka & Santa Fé, and the Northern Pacific are following suit, and other roads are fitting from 50 to 500 cars each. Up to the present time 15 railroad companies and three transportation companies, aggregating 35,855 cars, have the automatic, and six roads, aggregating 6,838 cars, have the non-automatic in use. Not all this stock, however, is as yet equipped. The brake company says that after two years' experience on some of these roads, the reports received concerning the brake are most gratifying. The Northern Pacific reports that there was not a single failure during the past severe winter. It is in use on grades of upward of 200 ft. per mile (Denver, South Park & Pacific, and no difficulty is said to be found in controlling the speed of trains while descending them. It is also working satisfactorily on screw dump cars on the Arizona & New Mexico Railway.

Railroad in Guatemala.

The city of Guatemala has recently been placed in direct communication with the port of San José on the Pacific Coast by the opening of a new line of railway. The total length of line is 72 miles—single track and the narrow 3 ft. gauge. Very heavy gradients, deep cuttings, seven high trestle bridges, and considerable trouble with made ground on the Lake of Amatitlan were the chief engineering difficulties to be conquered. Between Escuintla and Palin, a distance of 19 miles, the road rises over 3,000 ft.; the total rise between San José and Guatemala is within a few feet of 5,000. The entire rolling stock was imported from the United States, as was also a small portion of the steel rails used, but the greater part of the latter was imported from England. The engines consume wood almost exclusively; coal, being exceeding scarce in Guatemala, is only used on the steepest grades. The line from Escuintla has been built in a little less than a year, and the heavy work has been done entirely by natives. A branch line from Amatitlan to Antigua, the old capital, is projected. The survey and, in parts of the department of Chiquimula, the actual work for the Northern Railway, which will connect Guatemala with Santo Thomas on the Gulf of Honduras, a distance of 160 miles, is being actively pushed forward. This line is being constructed by a forced national subscription.—*The Engineer.*

An Oil-burning Street-car Motor.

A motor to burn earth oil is being constructed by Messrs. Merryweather, of London (England), for the Rangoon Steam Tramways. Previous experiments in this direction having proved satisfactory, a large saving in the cost of fuel is anticipated.

Test of Rotary Steam Snow-Shovel.

The rotary steam snow-shovel described and illustrated in the *Railroad Gazette* for Sept. 12, 1884, is to be tested shortly on a stretch of snow-covered track in the yards of the Buffalo & Southwestern Division of the Erie at Buffalo Creek Junction.

Representatives of the Illinois Central, the Chicago & Northwestern, and the Chicago, Burlington & Quincy roads are expected in the city to witness the test.

Railroad Superstructure in England and France.

At a meeting of the Railroad Society of Berlin, Jan. 23, Inspector of Railroad Construction Claus discussed railroad superstructure in England and France. The English railroads, he said, use wood cross-ties almost universally, and likewise double-headed rails and chairs. Steel is universally used for rails, whose length varies from 21 to 30 ft., the 30-ft. length becoming commoner. The weight of rails is from 78 to 86 lbs. per yard. All the companies, except the Great Northern and the Northeastern, use the suspended joint. Plain fish plates are used on but seven lines; generally plates strengthened on the lower side are used, the weight of a pair reaching 44 lbs. The joint plates are usually fastened by four bolts of ordinary form. Devices for locking the nuts are used only exceptionally. The weight of a chair varies on different roads from 32 to 52 lbs. The wooden key by which the rail is fastened in the chair weighs on the average 1 lb. The chairs are sometimes spiked to the ties and sometimes fastened by bolts which pass through the chair and the tie, with nuts on the underside of the tie. The ties are sawn from fir and creosoted, 9 ft. long—10 or 12 in. longer than the ties used in Germany. They are 10 to 12 in. wide and 5 to 6 in. thick. The ties are laid 26 to 28 in. apart from centre to centre at the joints, and 32 to 37 in. elsewhere. The total weight of the superstructure per yard always exceeds 400 lbs., and is 544 lbs. on the Metropolitan (underground) Railway. No provision is made against the creeping of rails, and none is needed for this solid construction. It rides very well, and requires a comparatively small force to keep it up.

The superstructure in Germany is much lighter. That with the Hilf system of iron sleepers weighs 279 lbs. per yard; the older Haarmann longitudinal sleeper system, 241 lbs.; the modern Haarmann system, 244 to 248 lbs.; superstructure with iron cross-ties, 272 lbs.; superstructure with wooden cross-ties weighs 280 to 320 lbs. per yard. The English engineers lay special stress on the importance of *weight* in the superstructure, claiming that the track resists certain disturbing forces only by its weight, especially those tending to raise the track in front of the first wheel, which, if not resisted loosen the road-bed in the ballast. They also claim it as an advantage that the rail is held so high above the ties by the chairs that the ties can be completely covered heavily with ballast, increasing the stability of the track and the durability of the rails. Mr. Claus referred to the statement in the *Railroad Gazette* of the use on the London & Northwestern of 20,000 steel ties, which he says are of the "Vautherin" form.

In France also only steel rails are laid now, and iron sleepers are used only experimentally. Three of the six great companies use T rails exclusively; the other three have doubleheads, but one of these uses 60-lb. T rails for new lines with light traffic. Elsewhere the weights are from 60

to 77½ lbs. per yard, and the lengths 5½ to 8 metres (18 ft. to 26 ft. 3 in.), while recently 9 and even 11 metre lengths have been laid. The joint is usually suspended, except on the Northern Company's lines. The joint ties are usually 24 in., the others 28 to 36 in. apart from centre to centre. The weight of the whole superstructure per yard varies from 294 to 428 lbs.

Fuel Economy on English Railways.

In a recent paper by Mr. J. Lowthian Bell "On the use of raw coal in the blast furnace" some figures in respect to fuel burned per train mile on English railroads were incidentally given, which seem to contradict the general impression—derived in part, no doubt, from reports of special tests or performances with special trains—that the fuel consumption in England is so very far below what is usual for engines of the same weight here.

Mr. McDonnell, Locomotive Superintendent on the Northeastern Railway, recently made some experiments for Mr. Bell, and furnished him with the pounds of coal burnt per train mile on nine of the great railways of the United Kingdom during the half-year ending June 30, 1883. These vary considerably according to the character of the traffic, nature of the ruling gradients, and probably, to some extent, according to the quality of the fuel employed. The lowest is 32.45 lbs. per mile, and the highest 47.02 lbs., the average of the whole being 42.21 lbs. per train mile. Two lengths of road were selected on the Northeastern system for the experiments. The same engines were used at both localities in the two sets of experiments; the trains consisted of the same number of wagons in the trials of coal and coke, and the loads were practically the same also. The trials were continued for one week with each kind of fuel, full loads being taken to the place of shipment and the wagons returned empty to the collieries:

	Coal. 1.2 p.c ash.	Coke. 7.4 p. c. ash.
One week's trial of fuel; pounds consumed per train mile	40.5	41.6
One week's trial of each kind of fuel; pounds consumed per train mile	37 0	42.2

Cost of Operating Early Locomotives.

The *Engineer* has recently published a good deal of information about early English locomotives, and among other things gives a table of the cost of operating locomotives on the Liverpool & Manchester Railway for the six months ending Dec. 20, 1844. Reduced to cents per mile run this was:

	Cts.
Fuel (coke)	4.04
Oil and tallow	0.44
Waste	0.02
Wages	2.77
Repairs:	
Materials	0.66
Labor	1.72
	2.38
General charges, water, cleaning, tender repairs, round-houses, salaries, etc	3.87
Total	13.52

The coke burned by mile run was 21.5 lbs. The cost of new engines was almost exactly $2,000 each. The weight and load hauled are not given. The statement includes 20 "coaching" engines, 14 "luggage" engines and 6 "jobbing" engines.

The ratio of labor to material for engine repairs on English railways is now as nearly as may be half of the total instead of nearly 75 per cent., and the total cost a little over 6 cents per train-mile.

A Big Blast.

By means of four tunnels, 50 ft. long, with an L at the end, under a bluff 60 ft. high, the San Francisco Bridge Co. has recently loosened 35,000 tons (perhaps 17,000 cubic yards or less) of rock, mixed with some earth, using 11,000 lbs. of "Judson powder," an explosive having a very small percentage of nitro-glycerine, but used as a substitute for common black powder. Eleven tunnels in all have been run for other explosions, the material being wanted for a sea wall. No fragments were thrown and there was but little noise.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Atchison, Topeka & Santa Fe, annual meeting, at the office in Topeka, Kan., April 16.

Chicago & Alton, annual meeting, at the company's office, in Chicago, April 6, at 10 a. m. Transfer books close March 14.

Denver & Rio Grande, meeting of the consolidated bondholders for consultation with the trustees, at No. 21 Nassau street, New York, at 1 p. m., on April 16. The annual meeting of the company will be held at Colorado Springs, Col., April 6.

Morgan's Louisiana & Texas, annual meeting, in New Orleans, April 6.

New York Central & Hudson River, annual meeting, in Albany, N. Y., April 15.

Peoria, Decatur & Evansville, annual meeting, in Peoria, Ill., March 28.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Milwaukee & St Paul, 3½ per cent., semi-annual, on preferred, and 1½ per cent. on common stock, payable April 27. Transfer books close April 6. The company drops from 3½ to 1½ per cent. on common stock.

Chicago, Rock Island & Pacific, 1¾ per cent., quarterly, payable May 1. Transfer books close March 28.

Chicago, St. Paul, Minneapolis & Omaha, 1½ per cent., quarterly, on the preferred stock, payable April 20. Transfer books close March 31. This company drops from 1¾ to 1½ per cent., and also decides to pay half-yearly hereafter instead of quarterly.

Evansville & Terre Haute, 1 per cent., quarterly, payable April 1. Transfer books close March 21.

Missouri Pacific, 1¾ per cent., payable April 1. Transfer books closed March 20.

St. Paul, Minneapolis & Manitoba, 1½ per cent., quarterly, payable May 1. Transfer books close April 18.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *General Time Convention* will meet at the Lindell Hotel in St. Louis, on Wednesday, April 8.

The *Association of American Railroad Superintendents* will hold its half-yearly meeting in Richmond, Va., on Wednesday, April 15.

The *American Association of Train Dispatchers* will hold its annual convention in Denver, Col., on Wednesday, June 3.

The *Master Car-Builders' Association* will hold its annual convention at the Hygeia Hotel, Old Point Comfort (Fortress Monroe), Va., beginning on Tuesday, June 9.

The *Master Mechanics' Association* will hold its annual convention in Washington, beginning on Tuesday, June 16.

The *Car Accountants' Association* will hold its annual convention in Minneapolis, Minn., beginning on Tuesday, June 23.

The *General Baggage Agents' Association* will hold its half-yearly meeting in St. Paul, Minn., on Wednesday, July 15.

The *Master Car-Builders' Club* will hold regular meetings at its rooms, No. 113 Liberty street, New York, on the evening of the third Thursday in each month.

The *New England Railroad Club* will hold its regular meetings at its rooms in the Boston & Albany station, in Boston, on the evening of the fourth Wednesday in each month.

The *Western Railway Club* will hold regular meetings at its rooms, No. 102 Adams street, Chicago, on the third Wednesday in each month.

Foreclosure Sales.

The Philadelphia & Chester County road was sold under foreclosure in Philadelphia, March 18, and bought for 40,000 by Wm. M. Smith, agent for the second-mortgage bondholders. Only 12,000 first-mortgage bonds are outstanding. The road is partly graded from Philadelphia to West Chester, but has no track laid. The chief value of the property is in the right of way for an entrance into Philadelphia.

National Association, General Passenger and Ticket Agents.

The annual meeting was held in New Orleans, March 17, and lasted only one day. The meeting was called to order by C. A. Taylor, Richmond, Fredericksburg & Potomac, Vice-President of the association. New York was selected as the place for the semi-annual meeting in September. Various applications for reduced rates were referred to the district associations in whose jurisdiction the reductions were desired, including the rates for the grand encampment of the Grand Army of the Republic at Portland, Maine, in June. A report was made by the committee on rates to the Exposition, and further action was recommended toward promoting travel to New Orleans during the continuation of the exhibition.

Considerable discussion was had upon the subject of checking sample trunks of jewelry salesmen, which, owing to their extraordinary value, impose a risk upon the roads disproportionate to the amount received as fares, and a committee of five was appointed to confer with the trade with a view of mutual protection against loss in handling this valuable property.

The election for officers resulted as follows: President, C. A. Taylor; Vice-President, John N. Abbott, New York, Lake Erie & Western; Secretary, A. J. Smith. The election of Mr. Abbott was made by acclamation, he being one of the oldest and most valued members. The meeting then adjourned *sine die*.

Baltimore & Ohio Employes' Relief Association.

The February sheet of this Association gives the following list of benefits paid during the month: Main Stem, Transportation Department, 142; Machinery Department, 208; Road Department, 113; Baltimore & Philadelphia, 3; Trans-Ohio divisions, 179; Pittsburgh Division, 82; physicians' bills, 207; total, 934.

The largest single payment was $1,000 to the mother of Charles A. Perkes, brakeman, accidentally killed on the Central Ohio Division.

ELECTIONS AND APPOINTMENTS.

Bangor & Piscataquis.—At the annual meeting in Bangor, Me., last week, the old directors and officers were re-elected.

Boston Society of Civil Engineers.—The following officer, have been elected for the ensuing year: President, Prof. George L. Vose; Vice-President, Frederick L. Rice; Secretary, H. L. Eaton; Treasurer, Henry Manly.

Calumet River.—The officers of this company are: President, R. Biddle Roberts; Directors, George M. Bogue, George Driggs, J. N. McCullough, Thomas D. Messler; Secretary, S. B. Leggett: Treasurer, John E. Davidson.

Cape Fear & Yadkin Valley.—The following circular from President Julius A. Gray announces changes already noted; it is dated Fayetteville, N. C., March 18:

"The completion of the Cape Fear & Yadkin Valley Railway from Greensboro, N. C., to Bennettsville, S. C., and the transfer of the construction force to the line west of Greensboro has rendered it impracticable for one official to discharge the duties of both Chief Engineer and General Superintendent.

"Mr. James S. Morrison, who has heretofore filled both these positions, will, as Chief Engineer, continue in charge of the Construction Department.

"Major W. M. S. Dunn has been appointed General Superintendent, and will have entire charge of the Transportation Department."

Cape Girardeau Southwestern.—Mr. D. L. Meyers has been appointed Purchasing Agent, with headquarters at Cape Girardeau, Mo.

Chesapeake & Ohio.—At the annual meeting in Richmond, March 19, the following directors were chosen: Williams C. Wickham, Richmond, Va.; John Echols, Louisville, Ky.; John Castree, Isaac E. Gates, A. T. Hart, Elias S. Higgins, C. P. Huntington, A. A. Low, A. E. Orr, E. T. Tournier, Ezra Wheeler, New York. There is no change from last year.

Chicago & Alton.—Mr. George J. Charlton is appointed Assistant General Passenger Agent, with office in Chicago.

Chicago, Milwaukee & St. Paul.—The Passenger Department has sent out the following notice of official changes:

"The following organization of the staff of this department takes effect at date:

"George H. Heafford, Assistant General Passenger and Ticket Agent. Office at Milwaukee, Wis.

"A. F. Merrill, Assistant General Ticket Agent. Office at Milwaukee, Wis.

"W. H. Dixon, Assistant General Passenger Agent. Office at St. Paul, Minn.

"F. A. Miller, Assistant General Passenger Agent. Office at Chicago, Ill.

"The Assistant General Passenger and Ticket Agent will rank as Chief of department staff."

Chicago, St. Louis & Pittsburgh.—Mr. Frank Van Dusen has been appointed Assistant General Passenger Agent, with office in Cincinnati, in place of C. C. Cobb, resigned.

Cincinnati & Eastern.—Mr. P. W. Naughton has been appointed Master Mechanic in place of J. C. Homer, resigned. Office at Batavia Junction, Ohio.

Danville & New River.—Mr. H. C. Lester, of Henry County, Va., has been chosen President in place of W. T. Sutherlin, resigned. Col. Thomas Dodamead, of Richmond, Va., has been chosen Superintendent. Col. Dodamead is well known as a superintendent of ability and wide experience in Virginia and other Southern states. He was for many years General Superintendent of the Richmond & Danville, and later held the same position on the Greenville & Columbia road. He will have his office at Danville, Va.

On taking charge of the road, Col. Dodamead issued the following:

"The undersigned hereby assumes the discharge of his official duties in charge of the operative department of this road, and hopes to have the cordial and zealous co-operation of all subordinates; and would impress upon them the importance of the most implicit obedience to orders, and a strict conformance to the rules and regulations heretofore governing them, which will be continued in force until otherwise changed or modified, of which due notice will be given."

Fairmont, Morgantown & Pittsburgh.—Mr. Thomas M. King has been chosen President in place of Wm. M. Clements, resigned.

Fitchburg.—The following officers are appointed for the Worcester Division (the Boston, Barre & Gardner road), all with offices at Worcester, Mass.: Henry A. Phillips, Superintendent; H. H. Marshall, General Agent Traffic Department; Walter M. Anthony, Assistant General Passenger Agent.

Grafton & Greenbrier.—Mr. George M. Whitescarver has been elected President in place of Wm. M. Clements, resigned.

Green Bay, Winona & St. Paul.—Mr. Gavin Campbell has been placed in charge of this road as Agent for the Farmers' Loan & Trust Co., trustee under the first mortgage.

Hoosac Tunnel Line.—Mr. John A. Greer is appointed General Manager of this fast freight line. He holds the same position on the West Shore Line.

Kansas City, Fort Scott & Gulf.—At the recent annual meeting the following directors were chosen: B. P. McDonald, Fort Scott, Kan.; C. W. Blair, Leavenworth, Kan.; O. E. Learnard, Lawrence, Kan.; H. H. Hunnewell, S. Bartlett, Charles Merriam, F. Gordon Dexter, F. M. Wells, Francis Bartlett, N. Thayer, Alpheus Hardy, John A. Burnham, T. S. Coolidge, Boston.

At the same time directors for the leased lines were chosen as below: *Rich Hill.*—George H. Nettleton, Wallace Pratt, L. W. Towne, W. J. Ferrey, J. S. Ford, Charles Merriam, C. W. Blair, B. P. McDonald, and O. E. Learnard. *Short Creek & Joplin.*—George H. Nettleton, J. S. Ford, L. W. Towne, Wallace Pratt, J. H. Emmort, W. J. Ferrey, I. P. Dana, W. E. Dunn, J. Brumback, P. P. McDonald, C. W. Blair, Charles Merriam, and O. E. Learnard. *Kansas & Missouri.*—George H. Nettleton, J. S. Ford, W. J. Ferrey, O. E. Learnard, C. W. Blair, and D. P. McDonald. *Fort Scott, Southeastern & Memphis.*—George H. Nettleton, Wallace Pratt, J. S. Ford, W. J. Ferrey, O. E. Learnard, C. W. Blair, B. P. McDonald, L. W. Towne, and Charles Merriam. *Fort Scott Equipment Co.*—George H. Nettleton, L. W. Towne, O. E. Learnard, J. S. Ford, Wallace Pratt, D. C. Jones, and C. W. Blair.

New York, Woodhaven & Rockaway.—At the annual meeting, March 25, the following directors were chosen: A. S. Hatch, James M. Oakley, John B. Thompson, D. C. Fisk, John H. Sutphin, P. H. Cassidy, Martin Freligh, A. M. Kidder, D. D. Conover, William A. Tompkins, William D. Hatch, C. B. Orcut, John Birdsall.

Ohio Railroad Commission.—Mr. Henry Apthorp has been appointed Commissioner of Railroads and Telegraphs of the state of Ohio.

Pennsylvania.—At the annual election in Philadelphia, March 24, the old board was re-elected, as follows: George B. Roberts, Wistar Morris, Alexander M. Fox, Alexander Biddle, N. Parker Shortridge, D. B. Cummins, Henry D. Welsh, John Price Wetherill, William L. Elkins, William Thaw, H. H. Houston, A. J. Cassatt and C. A. Griscom.

The board met March 25 and re-elected George B. Roberts President; Edmund Smith, First Vice-President; Frank Thomson, Second Vice-President; J. N. DuBarry, Third Vice-President; John P. Green, Fourth Vice-President; John C. Sims, Jr., Secretary; John D. Taylor, Treasurer.

Peoria & Pekin Union.—At the annual meeting, March 10, the following directors were chosen; James J. Fletcher, James F. How, John F. Martin, J. T. Terry.

Pittsburgh, Cincinnati & St. Louis.—Mr. Frank Van Dusen is appointed Assistant General Passenger Agent, with office in Cincinnati, in place of C. C. Cobb, resigned.

Pittsburgh & Western.—Messrs James Callery and John W. Chalfant, of Pittsburgh, have been appointed Receivers by the United States Court. Mr. Callery is President of the company, and Mr. Chalfant is a large holder of the bonds.

Pullman's Palace Car Co.—Mr. T. H. Wicks will be General Manager of this company's lines after April 1. Mr. C. A. Garcelon will succeed Mr. Wicks as Superintendent at St. Louis.

San Antonio & Aransas Pass.—Mr. J. U. Lott, of Corpus Christi, Tex., has been elected President of this company.

Shenandoah Valley.—Mr. Sidney F. Tyler has been chosen President in place of Mr. Frederick J. Kimball, resigned. Mr. Kimball remains a director.

St. Louis Coal Railroad.—The following appointments have been announced by the Receiver, Mr. R. J. Cavett: Mr. J. E. McGettigan, Treasurer and General Agent, St. Louis; Mr. C. H. Bosworth, General Freight and Ticket Agent, Pinckneyville, Ill.; Mr. Edward Brown, Auditor, St. Louis.

St. Louis & St. Joseph.—At the annual meeting in St. Louis, March 10, the following directors were elected: John R. Lionberger, St. Louis; Aug. Kountze, Chas. White, Moses Bruhl and Wm. F. Nisbett, New York; Chas. J. Holmes, Fall River, Mass.; Francis Gouldy, Newbury, Mass.

Toledo & Indianapolis.—The purchasers of this road have chosen Mr. T. P. Brown President and General Manager. He has issued the following notice: "David Robison, Jr., was discharged from the receivership of this road March 2, and has no further connection with it. Mr. J. M. O'Boyle will continue as General Freight and Ticket Agent, to whom all correspondence in relation to that department should be addressed. All remittances must be sent to Thomas L. Carpenter, Assistant Treasurer, Toledo, O. Address all other communications to the undersigned."

Toledo & South Haven.—Mr. E. Martin has been elected President.

Union Pacific.—At the annual meeting in Boston, March 25, the following directors were chosen without opposition: Charles Francis Adams, Jr., Frederick L. Ames, Elisha Atkins, Ezra H. Baker, F. Gordon Dexter, Mahlen D. Spaulding, Boston; Henry H. Cook, Sidney Dillon, David Dows, Andrew H. Green, New York; S. R. Callaway, Omaha, Neb.; Grenville M. Dodge, Council Bluffs, Ia.; Hugh Riddle,

Chicago; James A. Rumrill, Springfield, Mass.; John Sharp, Salt Lake, Utah.

Messrs. Spaulding, Cook and Callaway are the new members of the board, taking the places of Russell Sage, Jay Gould, and S. H. H. Clark.

At a meeting of the directors the following officers were elected: Charles Francis Adams, Jr., Boston, President; Elisha Atkins, Boston, Vice-President; Henry McFarland, Boston, Secretary and Treasurer; Oliver W. Mink, Boston, Assistant Secretary and Assistant Treasurer; James M. Ham, Assistant Secretary and Assistant Treasurer in New York.

Mr. J. T. Choate, of Boston, has been appointed Superintendent of the South Park Division, in place of Mr. D. K. Smith, resigned. Headquarters, Como, Col.

Mr. H. B. Wilbur, Boston Auditor of this road, having resigned, his duties will, for the present, be performed by Mr. Lane, Assistant to the President.

Vicksburg & Meridian.—Mr. M. S. Belknap has been appointed Superintendent of this road, with office in Vicksburg, Miss. He was recently on the Louisville & Nashville.

Virginia Midland.—Mr. A. McLean having resigned, Mr. A. S. Dunham is appointed Auditor of this company. Mr. Dunham was recently with the Chicago & Western Indiana, and was formerly with the Chicago & Eastern Illinois.

Westport & Redding.—The directors of this new company are: Miller Ketchum, Andrew C. Nash, Edward H. Nash, Horace C. Staples, Westport, Conn.; W. E. Allen, Bridgeport, Conn.; Thomas N. Browne, Brooklyn, N. Y.; John S. King, C. V. Sidell, Wm. Wiley, New York.

West Shore Line.—Mr. John A. Greer has been appointed General Manager, with office in Chicago. He has been connected with the Chicago, Burlington & Quincy and the Michigan Central roads.

Woodruff Sleeping & Parlor Coach Co.—At the annual meeting in Philadelphia, March 17, the following directors were chosen: Job H. Jackson, Wm. G. Johnston, E. Poulson, J. M. McClintock, E. J. Unger, Charles I. Travelli, Wilson McCandless, Henry Whelen, James J. Donnell. The board elected Job H. Jackson President; Wm. G. Johnston, Vice-President; Augustus Trump, Secretary and Treasurer; John C. Paul, General Manager.

PERSONAL.

—Major W. T. Sutherlin has resigned his position as President of the Danville & New River Co., on account of ill health.

—Chicago dispatches say that Gen. Anson Stager is dangerously ill at his residence in that city, and it is feared that he will not recover.

—Mr. John J. Stephens, for 27 years past Secretary of the Staten Island Railroad Co., died suddenly of heart disease in Brooklyn, N. Y., March 24. He was 79 years old.

—Mr. Frederick J. Kimball has resigned his position as President of the Shenandoah Valley Co., his duties as President of the Norfolk & Western requiring his undivided attention.

—Mr. Day K. Smith has resigned his position as Superintendent of the South Park Division of the Union Pacific, on account of the health of his wife, who is unable to live in Colorado.

—The statement that Mr. C. B. Meeker, General Passenger Agent of the New York Central & Hudson River road, was in a critical condition, is denied. Mr. Meeker has been very sick, but his health is now gradually improving.

—Mr. Samuel C. Forsaith died in Philadelphia, March 23, while on his way home from a trip to the South. He was for many years a prominent business man of Manchester, N. H., and head of the S. C. Forsaith Machine Co. of that city.

—Ex-Governor James D. Porter, of Tennessee, who has just been appointed Assistant Secretary of State of the United States, was for many years a director of the Nashville, Chattanooga & St. Louis Co., and was for several years and until the last election President of the company.

—Mr. George B. Ross, for 19 years past connected with the New York, Lake Erie & Western, and for four years past Master Mechanic of the Buffalo Division, has resigned that position and will on April 1 take charge of the New York office of the Dickson Manufacturing Co., of Scranton and Wilkes-Barre, Pa., as Agent.

—Mr. C. C. Cobb has resigned his position as Assistant General Passenger Agent of the Pittsburgh, Cincinnati & St. Louis and the Chicago, St. Louis & Pittsburgh roads, to take effect April 1. He will settle in New York. Mr. Cobb was at one time General Passenger Agent of the Indianapolis & St. Louis road, and has been connected with his present line four years. His resignation was accepted reluctantly.

—Major M. A. Cooper died at his residence in Cartersville Ga., March 19, aged 85 years. He was for many years a prominent lawyer and served several terms in the Legislature of the state and in Congress. He was an active advocate of the building of the Georgia Railroad, and in later years was President of the Cherokee Railroad, to whose construction he contributed largely. Since the war he has been chiefly engaged in developing the coal and iron mines of Northwest Georgia, and was the chief owner of the Etowah Iron Works.

TRAFFIC AND EARNINGS

Coal.

Coal tonnages for the week ending March 14 are reported as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Anthracite	564,647	443,669	I. 120,978	27.2
Eastern bituminous	171,922	168,295	I. 3,627	2.1
Coke	54,880	53,797	I. 1,092	2.0

The Reading gives notice that, its quota for March having been filled by the 20th, mining will be stopped from that date to the end of the month. Similar action will probably be taken by nearly all the other companies. The April quota can be filled by mining about three-quarters time.

Pennsylvania Railroad tonnage for the week ending March 14 was:

	Coal.	Coke.	Total.	1884.
Line of road	147,730	53,341	201,071	183,312
From other lines	87,247	1,548	88,795	63,066
Total	234,977	54,899	289,866	246,378
Year to March 14	2,009,799	473,335	2,483,134	2,531,283

Increase for the week, 43,488 tons, or 17.3 per cent.; decrease for the year, 48,149 tons, or 1.9 per cent.

Cumberland coal shipments for the week ending March 21 were 55,740 tons. Total to March 21 this year, 408,573 last year, 393,349; increase, 15,224 tons, or 3.9 per cent.

Anthracite coal tonnage for February and the two months ending Feb. 28, as given by Mr. John H. Jones, the Official Accountant, was as follows, the statement including the entire production of anthracite coal, excepting that consumed by employés, and for steam and heating purposes about the mines:

	February.		Two months.	
	1885.	1884.	1885.	1884.
Phila. & Reading	655,452	664,970	1,257,422	1,346,752
Lehigh Valley	279,743	376,720	620,488	769,552
Del., Lack. & Western	309,901	345,366	548,321	652,622
Del. & Hud. Canal Co.	167,949	196,113	332,946	395,825
Pennsylvania R. R.	220,265	203,432	428,864	415,756
Coal Co.	91,373	79,273	155,377	167,885
N. Y., L. E. & W.	43,025	26,813	66,093	43,867
Total	1,767,708	1,892,687	3,409,511	3,792,259

The decrease for February was 124,979 tons, or 6.6 per cent.; for the two months, 382,748 tons, or 10.1 per cent. For the two months the Pennsylvania Railroad Co. and the Erie only show increases.

The allotment for January and February under the agreement was 3,000,000 tons, or 409,511 tons less than the actual shipments.

The stock of coal on hand at tidewater shipping points Feb. 28 was 665,565 tons; Jan. 31 it was 837,104 tons, showing a decrease of 171,539 tons, or 20.5 per cent. during the month.

The percentage of the total output credited to each company for the two months was as follows, comparison being made with last year, and also with the allotment made for the present year under the companies' agreement:

	Alloted.	1885.	1884.
Philadelphia & Reading	38.85	36.9	35.5
Lehigh Valley	19.60	18.2	20.3
Delaware, Lackawanna & Western	16.05	16.1	17.2
Delaware & Hudson Canal Co.	11.00	9.7	10.4
Pennsylvania Railroad Co.	8.00	12.6	11.0
Pennsylvania Coal Co.	5.00	4.6	4.4
New York, Lake Erie & Western	1.50	1.9	1.2
Total	100.00	100.0	100.0

The Pennsylvania Railroad Co., it will be remembered, is not a party to the agreement.

A dispach from Montreal, March 23, says: "The Grand Trunk Railway Company has awarded contracts for the supply of 375,000 tons of coal. Of this amount 250,000 tons is to be delivered at the Suspension and International Bridges, 55,000 tons at Detroit, 20,000 tons at Sarnia, 20,000 tons at Brockville, and 30,000 at Portland, Me. The contracts for the supply at Niagara were awarded as follows: 80,000 tons to Messrs. Bell, Lewis & Yates, of Buffalo; 130,000 tons to the New York, Lake Erie & Western Railway, and 20,000 tons to the Rochester & Pittsburgh Railway. The coal to be delivered at the International Bridge sold at the following rates: Lump, $2.25 per ton; lump and nut, $2.20 per ton and run of mine $2.05 per ton. At Suspension Bridge the same kinds of coal brought $2.40, $2.35, and $2.20 per ton, respectively. The Detroit and Sarnia contract was awarded to the Cleveland, Lorain & Wheeling Railway, at prices of $2.05 per ton at Detroit and $2.20 per ton at Sarnia. The coal at Brockville is to be delivered by Messrs. Bell, Lewis & Yates at $3.50 per ton. The contract for Portland, Me., was secured by the Chesapeake & Ohio Coal Co. at $3.50 per ton. Over 100 tenders were submitted."

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Two months ending Feb. 28:				
Cin., W. & Balt.	$309,595	$262,220	I. $47,375	18.1
Connotton Val.	42,273	42,813	D. 540	1.2
Net earnings	5,110	*1,775		
Denver & R. G. Western	126 026	101,184	I. 24,842	24.6
Mexican National	266,979	268,520	D. 1,541	0.4
Nash., C. & St. L.	359,905	397,487	D. 37,582	9.5
Net earnings	148,772	166,004	D. 17,232	10.4
Northern Cent.	793,265	808,458	D. 15,193	1.9
Net earnings	304,551	256,467	I. 48,084	18.7
Pennsylvania	6,353,202	7,000,946	D. 647,744	9.2
Net earnings	1,821,044	2,290,695	D. 469.651	20.4
Texas & St. L.	147,239	119,150	I. 28,089	23.6
Month of January:				
Dan. & Norwalk	$14,161	$12,196	I. $1,965	16 3
Gal., Har. & San. Ant.	211,096			
Net earnings	82,769			
Louisiana West.	39,828			
Net earnings	19,007			
Tex. & N. Orl'ns.	65,074			
Net earnings	23,708			
Month of February				
Cin., W. & Balt.	$153,941	$116,569	I. $37,372	32.0
Connotton Val.	23,104	19,620	I. 3,484	17.8
Net earnings	4,464	*190		
Denver & R. G. Western	58,985	44,194	I. 14,791	33.6
Mexican Nat.	138,656	135,928	I. 2,728	2.0
Nash., C. & St. L.	174,918	210,465	D. 35,577	16.9
Net earnings	69,884	91,274	D. 21,390	23.5
Northern Cent.	389,048	398,612	D. 9,564	2 4
Net earnings	136,818	119,675	I. 17.143	14.3
Pennsylvania	3,077,680	3,428,713	D. 351,033	10.2
Net earnings	830,469	1,124,559	D. 294,070	26.0
Texas & St. L.	83,958	49,268	I. 34,690	70.4
Second week in March:				
Chi. & Alton	$180,171	$183,195	D. $3,024	1.6
Chi. & East. Ill.	34,955	26,934	I. 8,021	29,7
Chi. & Nor'west.	422,000	385,400	I. 36,600	9.5
Cin., Ind., St. L. & Chi	53,504	46,319	I. 7,185	15.6
Illinois Central	234.300	228.559	I. 5.741	2.5
Iowa lines	34.830	37,423	D. 2,623	7.0
Mil & No	12,435	11,515	I. 920	8.0
Roch. & Pitts.	21,256	18,273	I. 2,983	16.3
Third week in March:				
Chi., Mil. & St. P.	$470,000	$422,055	I. $47,945	11.4
Long Island	42,579	39,360	I. 3,219	8.2
Roch. & Pitts	20,045	18,273	I. 1,772	9.7
St. L. & San F.	87,700	94,600	D. 6,900	7.3

* Deficit.

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Cotton.

Cotton movement for the week ending March 20 was as follows, in bales:

	1885.	1884.	Inc. or Dec.	P. c.
Interior markets:				
Receipts	20,440	38,155	D. 18.715	49.2
Shipments	31.417	61,760	D. 30.343	48.9
Stock, March 20	170,155	160,809	I. 9,346	5.8
Seaports:				
Receipts	32,885	42,635	D. 9,750	22.9
Exports	51,947	75,326	D. 23,379	31 1
Stock, March 20	702,616	788,889	D. 86,273	10.9

The total shipments from plantations for the cotton year (from Sept. 1) to March 20 are estimated at 5,357,088 bales, against 5,291,282 in 1883-84, 6,232,800 in 1882-83, and 4,953,153 1881-82.

Trunk Line Presidents' Meeting.

A meeting of the Trunk Line presidents was held at Commissioner Fink's office in New York, March 23, at which the present situation was fully discussed. It was agreed to continue the Chicago pool for 30 days, until May 1 next, with the expectation that before that time some means may be devised for a permanent settlement of the existing troubles.

Petroleum.

The production and shipments of the Pennsylvania and New York oil fields for February is given by *Stowell's Petroleum Reporter* as follows, in barrels of 42 gallons:

	1885.	1884.	Inc. or Dec.	P.c.
Production	1,437,884	1,880,650	D. 442,766	23.6
Shipments	1,895,021	1,723,261	I. 171,760	10.0
Stock, Feb. 28	36,757,137	36,041,898	I. 715,239	1.9
Producing wells	21,987	20,930	I. 1,057	5.0

The production is the smallest reported in any month since May, 1879. Of the total the Alleghany District in New York furnished 12.7 per cent.; the Bradford District in Pennsylvania 43.3; the Warren District 10.6, and the Lower District 33.4 per cent.

The shipments, though large, were exceeded in five months of last year, as for several months past they were considerably in excess of the production.

Stock on hand was diminished during February by 457,137 barrels, which is the excess of shipments over production for the month.

During the month there were 62 new wells completed and 7 dry holes, or failures to find oil, are reported. On Feb. 28 there were 109 new wells under the drill, and 59 new rigs in preparation to drill others. No new wells of very large production were opened.

Shipments for the month were as follows:

	Crude.	Refined.	Total.	P. c. of total.
New York	626,615	78,053	704,668	37.2
Philadelphia	293,218	8,760	301,978	15.9
Baltimore	135,186	1,483	136,669	7.2
Boston	13,912	96,462	110,374	5.8
Cleveland	258,315	... .	258,315	13 7
Pittsburgh	94,736	.....	94 736	5.0
Local points	228,827	59,454	288,281	15.2
Refined at Creek refineries	244,212	.....	.....	...
Total	1,895,021	244,212	1,895,021	100.0

In this table the refined is the oil refined at Creek refineries. It is reduced to its equivalent in crude, so that the total shows the amount of crude oil shipped to each point, whether in crude or refined form.

Transcontinental Traffic Association.

The Central Pacific has joined with the Union Pacific in its notice to the Pacific Mail Steamship Co. of the termination of the contract in relation to Pacific Coast freights.

The Association met in Denver, March 20, pursuant to adjournment. The first day was spent in discussion of the situation.

On the second day it was unanimously agreed that the rates of freight on all traffic to and from all points in California Washington Territory, and all points east of the 97th meridian, be restored to the tariffs of March, 1884. The agreement goes into effect March 26, and to be strictly maintained thereafter. The percentages awarded by Arbitrator Tucker will govern in the future all roads interested, including the Southern Pacific, the Union Pacific agreeing thereto. The meeting was entirely harmonious.

On the third day (Monday) it was decided to defer the election for Commissioner, and L. G. Cannon, the acting Commissioner, was elected General Agent and Auditor of the pool. The old contract was amended by a few unimportant particulars, and was then signed by representatives of all the roads forming the pool. The meeting was then adjourned to meet in Chicago some time in August.

Western Trunk Lines Association.

A meeting was held in Chicago, March 20, at which there were present Messrs. S. R. Callaway, General Manager Union Pacific; R. R. Cable, President Rock Island road; J. F. Tucker, Assistant General Manager St. Paul road; James Smith, General Traffic Manager Wabash road, and the following arbitrators: Judge G. D. Lake, of Omaha, for the Union Pacific; John C. Gault, Chicago, for the Wabash; George M. Bogue, Chicago, for the Rock Island; J. C. Spencer, Milwaukee, for the St. Paul road. Commissioner E. P. Vining was present for a short time. The representatives of the several lines laid the subject before the arbitrators, informing them of the position which the Northwestern road occupied toward the Western Trunk Line Association. This road had signed the agreement, but had not placed its official seal upon the document, as was done by the other roads. Although the Northwestern claimed to be a member of the association, it did not report all its business to the commissioner. It reported everything except the most important freight coming from points near Fremont and Norfolk, from along the lines of the Sioux City & Pacific and the Fremont, Elkhorn & Missouri Valley roads. Matters had proceeded to such a state that the tariffs of the association no longer contained the Northwestern's name. The Union Pacific had been the first to ask for arbitration, while the Northwestern had refused to appoint an arbitrator. In the afternoon the arbitrators met alone and elected Judge Lake Chairman and Mr. Bogue Secretary. It was decided to adjourn until Thursday, April 2. If the Northwestern appoints no arbitrator by that time the other members of the Arbitration Committee will appoint one for it and then decide whether the Northwestern is a member of the association.—*Chicago Inter-Ocean, March* 21.

Stopovers on Pacific Coast Emigrant Tickets.

The Union Pacific Co. announces that emigrants to Oregon and Washington by its line will hereafter be allowed to stop over at any point west of Shoshone, Idaho. Stopovers will be permitted at more than one point, but the entire extension of time must not exceed 10 days over the original limit of the ticket. When passengers decide to stop permanently at a point short of the destination to which their baggage has been checked, the station agent will have the baggage returned free of charge.

Southwestern Association Lumber Rates.

An advance of 4 cents per 100 lbs. will be made April 1 in the rates on lumber from Chicago to Missouri River points, making them, in cents per 100 lbs.:

To Kansas City, St. Joseph, Atchison and Leavenworth:	Cents
From Chicago and Peoria	16
" Detroit and Toledo	22½
" Moline, Rock Island, Davenport and Muscatine	12½
" Burlington, Ft. Madison, Montreal and Keokuk	11½
" Quincy, Hannibal and Louisiana	10½
" Alton, St. Louis and East St. Louis	9½

These are lower than the regular rates have usually been, from Chicago amounting to about 0.65 cent per ton per mile.

RAILROAD LAW.

Oregon Railroad Law.

The Legislature of Oregon at its recent session passed a railroad law, of which Section 1 provides that equal rates shall be charged to all persons for similar service. Rates must be reasonable, and no increase of schedules in force Jan. 1, 1885, shall be allowed, and no passenger rate shall exceed 4 cents per mile. All passengers must be given the same accommodations, but railroads may provide separate cars for classes of persons. No break or stoppage shall prevent any

carriage of person or property from being considered as one continuous carriage.

Section 2 prohibits the allowance of any rebate, drawback or other indirect advantage.

Section 3 prohibits any combination to break the continuity of carriage, whether by change or transfer of cars, change of time or in other ways. It also prohibits all pooling agreements between competing lines.

Section 4 prohibits the charging of a higher rate for a shorter than for a longer distance in the same direction, on similar classes of freight.

Section 5 requires railroads to keep posted in places accessible to the public schedules of fares, rates and classification of freight. These schedules shall be posted on the first Monday in January and July of each year, and rates must not be increased in the intervening six months. All lines owned or leased by a corporation shall be considered as one road.

Section 6 provides that the carriage of property shall be considered continuous, whether it is entirely over one road or over two or more connecting roads.

Section 7 gives persons aggrieved by violations of this act the right to sue for damages in any Court of competent jurisdiction; service of process to be made on any agent or officer of a company.

Section 8 provides that any director, officer, receiver or agent of a company violating this law or failing to obey its provisions, may be held guilty of a misdemeanor and may be fined not less than $1,000.

Section 9 includes as persons within the meaning of the law corporations, officers thereof, receivers, trustees, lessees and agents.

Kansas Railroad Legislation.

There will no doubt be much anxiety to know what was done during the recent session touching railroad questions.

A law was enacted requiring the companies to fence their tracks when running through inclosed fields, and to provide crossings and gates for stock. Also a law requiring a prompt settlement of damages occasioned by fire.

After the subject of maximum rate laws had been very fully discussed in both branches of the Legislature, it became apparent that nearly all elements were convinced that it was impracticable to go into the question of re-classifying freight and of passing fixed laws as to rates, as this method of dealing with the subject had been abandoned wherever it had been attempted in other states. It was also found on a fuller examination that the work already done by the Board of Commissioners had been of vastly more consequence to the state than has been generally supposed.

The result was that each house prepared and passed a bill to enlarge the powers of the Commissioners.

These bills were very much alike in principle, but as neither house adopted the bill of the other a conference committee was called for by the Senate on the day before the adjournment. This committee consisted of five from the House and three from the Senate, and after several hours' work the committee reported a bill which passed the Senate without any opposition, although it did not in all its details conform to the views of every Senator. This bill received a very large majority of the votes of the House, but failed to obtain the necessary constitutional majority of 63 votes. Many of the members had become worn out, after being up nearly all of two nights, and were not present.

All who were present voted for it except 24, and thus the conference bill was finally defeated.

Of the eight members composing the conference committee, six voted for the bill and signed the report in favor of it.—*Topeka (Kan.) Commonwealth.*

New Jersey Railroad Legislation.

The Committee on Railroads and Canals of the New Jersey Assembly has reported a measure announcing the intention of terminating the immunities of certain corporations from taxation, which has caused a great stir at Trenton. This proposed act, which affects nearly all the railroads in the state, is as follows:

"*A Joint Resolution* declaring the purpose of the state respecting immunities from taxation heretofore enjoyed by certain railroad and canal companies:

"*Whereas*, For the purpose of encouraging the building of railroads and canals in this state, the Legislature did, in the charters of certain railroad and canal companies, grant to such companies certain exemptions and immunities from taxation, reserving, however, to the state the power to repeal said charters and in some cases to take the railroads and canals at the expiration of 50 years from the completion of the same; and whereas, this policy of the state has existed for nearly 50 years, and the immunities granted have in some cases been an entire exemption from taxation for many years, and in other cases have been the fixing of a rate of taxation less than that borne by other taxpayers; and whereas, this policy of the state has fully accomplished its purpose in the successful and profitable development of the railroads and canals of the state; and whereas, the railroad and canal property in the state has so enormously increased that it now constitutes more than one-fourth of all the property in the state subject to taxation; and whereas, some of said companies claim that the immunities granted to them constitute contracts between the state and such companies which cannot be rescinded at the will of the Legislature; therefore,

"*Be it resolved* by the Senate and General Assembly of the state of New Jersey, That the time has come when all such immunities and exemptions should cease, and that any further continuance of the same is unjust to the people and endangers the welfare of the state; and the state hereby declares its purpose to bring to a speedy end all such special immunities and exemptions, either by the enforcement of the general laws respecting taxation, the repeal of the charters of such companies, the taking of said railroads and canals, or the condemnation of such alleged contracts, if any exist, and by such other powers of the state as it may be expedient to employ, to the end that just taxation may be established throughout the state."

OLD AND NEW ROADS.

Albemarle & Raleigh.—It is stated that this company has bought the Jamesville & Washington road, running from Jamesville, N. C., south to Washington, 22 miles. To connect with the new purchase, an extension will be built from the present eastern terminus at Williamston east to Jamesville, about 10 miles.

Atchison, Topeka & Santa Fe.—This company has placed, through Baring Brothers & Co., of London, an issue of $2,500,000 new sinking fund 6 per cent. bonds secured by pledge of $2,753,000 bonds of lepsed lines. The price at which the loan was taken is said to be 107 flat. The proceeds are to be used in paying for new branch lines, and in the expenditures required to complete the California Southern connection with San Diego. This makes $5,000,000 of these bonds issued within a year, $2,500,000 having been placed some months ago.

Surveys are in progress for a branch from Bernalillo, N. M., to the Jimez hot springs, a distance of 25 miles.

Bangor & Piscataquis—At the annual meeting last week it was stated that the gross earnings of this road for 1884 were $130,892, the expenses $64,356 (49.1 per cent.), and the net earnings $66,536. There were 42,419 passengers and 54,032 tons of freight carried during the year.

Boston & Albany.—The route of the Newton Circuit is now definitely fixed upon for its entire length, and the grading is in progress between the main line and the Newton Highlands Branch. The road is to be double-tracked, steel-railed, and made as perfect as modern appliances will permit. Three stone stations are to be erected between Riverside and the Newton Highlands Branch—one at Washington street, one at Beacon street and one at Boylston street, west of the Highlands. The line will not be completed until the latter part of next fall, and when it is the entire suburban service will be rearranged and greatly increased.

Branchport & Penn Yan.—This company has filed articles of incorporation to build a railroad from the town of Penn Yan, N. Y., to Branchport, a distance of 8 miles. Branchport is at the head of the western arm of Lake Keuka.

Canadian Pacific.—The Canadian government has rejected the proposal of this company for an issue of bonds, and a new plan for the relief of the company is to be prepared and submitted to the government.

Cape Fear & Yadkin Valley.—The North Carolina Legislature has recently passed an act allowing the city of Wilmington to subscribe $250,000 to the capital stock of this company, in order to aid in extending the road from Fayetteville to Wilmington, a distance of about 89 miles.

Carolina Central.—The Attorney General of North Carolina has given his opinion that this company is the owner of the graded road-bed extending from its present terminus at Shelby, N. C., to Rutherfordton; and further, that as successor to the old Wilmington, Charlotte & Rutherfordton Co. it has authority to extend its road from Shelby to any point on the Tennessee or Virginia line without any further action of the Legislature.

Central, of New Jersey.—At a meeting of the board of directors in New York, March 23, a further proposition for a settlement was received from the Reading, but was promptly rejected by the board. President Little was instructed to make application to the courts to recover possession of the property. The receivership under the Chancellor of New Jersey has never been terminated, and should the Chancellor order the Reading to surrender possession, the road will revert to the Receiver.

The Philadelphia *North American* says: "Serious complications threaten to grow out of the failure of the Reading to comply with the terms of the Central to that company. The Lehigh & Susquehanna Railroad, which is owned by the Lehigh Coal & Navigation Co., was leased a number of years ago to the Jersey Central for a long term of years, but when the Reading took control of the Central this lease was modified by the consent of all parties, and the Reading assumed the payments provided for under the lease. Friends of the Central say that it is now a serious question whether the Lehigh & Susquehanna has not passed beyond the control of the Central. As it is a profitable road they fear that the Reading will insist upon retaining control of it."

Central Pacific.—It is announced that this company will make an issue of $10,000,000 new bonds, to be known as convertible debenture bonds. They are to be issued for the purpose of funding into a long bond the greater part of the accumulated floating debt and to provide for the completion of the Oregon Division and other additions to the property. The company, it is stated, has expended on construction and betterments during the past five years nearly $10,000,000, not included in operating expenses, and against which no stock or bonds have been issued, and during the past ten years more than $14,000,000. During the same period the net funded debt has decreased by sinking funds and land sales nearly $8,000,000. The new bonds bear 6 per cent. interest and run for 30 years, and $5,000,000 have already been taken at par by the holders of the unfunded debt. Provision is made allowing conversion of the principal sum into capital stock within eight years, but no exchange is to be made at less than $50 per share.

Chesapeake & Nashville.—The final location of this line from Nashville, Tenn., eastward, is now in progress. It is not yet decided whether the connection with the Kentucky Central will be made at Stanford or Danville. The last-named town offers ground for station and shops and a cash bonus.

Chicago, Milwaukee & St. Paul.—The question of the common stock dividend was decided at a meeting of the board in New York, March 25. The directors, after a spirited discussion, declared a dividend of 1½ per cent. on the common stock and 3½ per cent. on the preferred stock for the last six months of the year ending Dec. 31, 1884. For the first half of last year a dividend of 3½ per cent. on each class of stock was paid. The reduction in the dividend on the common stock gives the holders of that stock 5 per cent. for the year.

Chicago, St. Louis & Pittsburgh.—The following is a comparative statement for the year ending Dec. 31, in advance of the annual report:

	1884.	1883.	Inc. or Dec.	P.c.
Gross earnings	$4,396,840	$5,293,920	D. $897,080	17.0
Operating expenses	3,602,212	4,335,964	D. 733,752	16.9
Net earnings	$794,628	$957,956	D. $163,328	17.1
Other income	80,045	27,017	I. 53,028	196.4
Total income	$874,673	$984,973	D. $110,300	11.2
Interest, etc.	1,100,826	799,914	I. 300,912	37 6
Balance	D. $226,153	S. $185,059	D. $411,212	...

The decrease in earnings is chiefly due to the low rates at which a large part of the traffic was carried. The large increase in charges results from the completion of the reorganization and the maturing of interest on the new bonds issued by the present company.

Chicago, St. Paul, Minneapolis & Omaha.—The *Commercial and Financial Chronicle* gives the following statement for this road for the year ending Dec. 31, the December expenses and land receipts partly estimated:

	1884.	1883.	1882.
Miles (end of year)	1,300	1,280	1,150
Gross earnings	$5,782,436	$5,515,285	$4,962,202
Operating expenses	3,795,540	3,422,941	3,068,313
Taxes	223,475	200,886	172,474
Total	$4,019,015	$3,623,827	$3,240,787
Net earnings	$1,763,421	$1,891,458	$1,721,415
Interest on debt	1,305,873	1,222,371	1,134,752
Less interest, etc., received	119,245	153,624	120,866
Balance	$1,186,628	$1,068,747	$1,013,886
Rentals, etc	49,175	47,921	27,736
Total charges	$1,235,803	$1.116,668	$1,041,622
Amount for stock	$527,618	$774,790	$679,793
Net cash from lands	590 123	547,777	546,825
Total net income	$1,117,741	$1,322,567	$1,226,618
Dividends on preferred stock	788,195	770,476	735,397
Surplus	$329,546	$552,091	$491,221

"The surplus of $329,546 for 1884 thus compares with a surplus of $552,091 in 1883, and of $491,221 in 1882, 7 per cent. dividends having been paid in all these years. On the 6 per cent. basis which has now been adopted for 1885, the call for dividends will be $112,599 less than the amount paid in 1884, and this decreased charge will not be altogether wiped out, even if the whole of the new stock lately listed should be sold, as that would give an increase of only $882,956. Evidently, therefore, motives of prudence have prompted the officials of the road in making the reduction."

Columbus & Eastern.—The United States Circuit Court in Columbus, O., has appointed a receiver for this road, on application of the creditors. The road, which was built about a year ago, extends from Hadley Junction, O., to Redfield, 35 miles, and its trains run over the Ohio Central from Hadley Junction to Columbus. It was built to develop coal property, the same parties owning both the road and the coal mines, but has been unprofitable owing to the condition of the coal business during the past year. The company has $1,000,000 first-mortgage bonds and a considerable floating debt

Columbus, Hocking Valley & Toledo—A dispatch from Cleveland, O., March 23, says: "Justice Stanley Matthews has just submitted a decision in the important suit brought by the Hocking Valley & Toledo Railroad against the Ohio Central for net profits derived by the Ohio Central through increased shipments of coal over the latter road on account of the strike in the Hocking Valley. On Jan. 13, 1883, the Ohio Central, the Baltimore & Ohio and the Columbus & Hocking Valley railroads formed a pool in the coal business. The agreement entered into by each road provided that the business and earnings of the parties should be equalized upon a basis of 54½ per cent. to the Hocking Valley, 27 per cent. to the Ohio Central, and 18½ per cent. to the Baltimore & Ohio. Some time after this contract went into effect the Central Trust Co. of New York brought suit to foreclose a mortgage on the Ohio Central, and by its request a receiver was appointed. On account of the late strike in the Hocking Valley, through which runs the Columbus, Hocking Valley & Toledo road, the amount of coal usually shipped over this line was greatly reduced, and the business of the Ohio Central relatively increased, and, in consequence of this, a fund of $50,000 net receipts arising from that excess accumulated in the hands of the Receiver.

"The Columbus, Hocking Valley & Toledo then asked leave of the Court to file an intervening petition in the case brought by the trust company to have the court determine whether or not the Receiver was bound to recognize the pooling contract. This motion was allowed by Judge Baxter, and the matter was referred to A. J. Ricks, Clerk of the Circuit Court, as Special Master Commissioner. The questions to be determined by him, according to the order of Judge Baxter, were, first, whether the pooling contract was received by the Receiver subsequent to his appointment, and if not, whether he and the Columbus, Hocking Valley & Toledo recognized and acted in good faith upon the belief that that contract was in force and mutually obligatory upon them; to ascertain and report what caused the inequalities in earnings of the contracting parties, and whether the diminished earnings of the Columbus, Hocking Valley & Toledo arose from any fault on its part, and if so, what the fault was; what amount, if anything, was due the Columbus, Hocking Valley & Toledo under the contract.

"Special Master Ricks, after hearing the testimony, filed his report, in which he found that, so far as the facts showed, the parties to the contract entered into it free from any conspiracy or intent to impose upon the public higher rates for transportation or restricted facilities for the transaction of public business than had before been offered by them, or than was afforded by other lines in the state, and if the contract is to be enforced, they should stand upon the same footing, so far as equities between them are to be adjusted. The inequality in their earnings was not caused by fault of the one or procurement of the other, but was the result of influences neither party originated or controlled, and therefore if the contract is one which the court can recognize and enforce, the Columbus, Hocking Valley & Toledo road is justly entitled to the net profits which have accrued to the Receiver upon the excess of coal business which went over the road, growing out of the suspension of thecoal traffic on the petitioner's road. Upon the third point the Master found that there is due to the petitioner, the Columbus, Hocking Valley & Toledo Co from the Receiver of the defendant road, the sum of $50,000. These findings were submitted to Justice Matthews, who has made a decision affirming Mr. Ricks' report."

Connotton Valley.—The Receiver's statement for February and the two months ending Feb 28 is as follows:

	—February.—		—Two months.—	
	1885.	1884.	1885.	1884.
Earnings	$23,104	$19,620	$42,273	$42,813
Expenses	18,640	19,810	37,163	44,588
Net earnings	$4,464	*$190	$5,110	*$1,775

*Deficit.

For the two months the gross earnings decreased $540, or 1.2 per cent., and the expenses $7,425, or 16.5 per cent., changing last year's deficit into small net earnings this year, a total gain of $6,885.

Fort Madison & Northwestern.—Recently S. B. Kenrick was appointed Receiver of this road in a suit brought by some of the creditors. Others of the creditors are opposed to this action and have applied to the Superior Court to have this appointment vacated and a new action begun. The Union Trust Co., of New York, trustee under the mortgage, has joined in this latter application, and the case was to be heard this week.

Fort Worth & Denver.—Work on the extension of this road is progressing well. The grading is well advanced and the rails are reported down for 6 miles northward from the old terminus at Wichita Falls, Tex. The tracklayers are following up the grading as closely as possible.

Galesburg, Lacon & Chicago.—This company has been organized to build a railroad from Galesburg, Ill., eastward about 50 miles to Lacon, where connection will be made with the Chicago & Alton road.

Green Bay, Winona & St. Paul.—On March 23 the Farmers' Loan & Trust Co., of New York, took possession of this road as trustee under the first mortgage, appointing Gavin Campbell its Agent in charge of the property. The company made default on the coupons due Feb. 1 last on the bonds.

The trustee subsequently filed complaint in a foreclosure suit in the United States Circuit Court. The Court confirmed it in possession of the road, with the ordinary powers of a receiver.

Intercolonial.—The earnings of this road for the half year ending Dec. 31 last were $1,239,006, of which $750,556 was derived from freight and $416,553 from passenger traffic; the net earnings were $9,068.

Jacksonvil'e & Montgomery.—This company has filed articles of incorporation to build a railroad from Montgomery, Ala., through Anniston and Jacksonville to Carrollton, Ga. The company intends to use an old graded road-bed for a considerable part of the distance.

Lake Shore & Michigan Southern.—It is stated that the new bonds of this company were awarded last week to a syndicate represented by H. B. Hollins & Co., of New York, and including the banking houses of August Belmont & Co., Vermilye & Co., I. & S. Wormser, Hallgarten & Co., and Blake Brothers & Co. It was stated by persons interested in the purchase that the price paid for the bonds was 127.

Long Beach.—Work has been begun on this road, which is to extend along Long Beach from Sea Haven, N. J., northward to Barnegat, a distance of 21 miles. The work is to be pushed forward with the intention of opening the road for traffic next summer. For the present connection will be made with the Tuckerton Railroad by ferry from Beach Haven, 3 miles north of Sea Haven. The road will probably be extended hereafter from Barnegat north to a connection with the Philadelphia & Long Branch, forming a section of the line which will run along the New Jersey beaches from Sandy Hook to Cape May.

Long Island.—Work has been begun on a branch which is to run from this road at Woodsburg, N. Y., to Cedarhurst, a distance of 3 miles. The road will be built by members of the Rockaway Hunt Club, which has a club-house at Cedarhurst.

Louisville & Nashville.—The Henderson bridge over the Ohio River is rapidly nearing a finished condition. Three spans on the Kentucky and five on the Indiana side are now in position. The masonry is not yet complete, but a week of good weather will perfect that. The bridge contains five spans of 120 ft., five of 240 ft., two of 250 ft. and the channel span of 525 ft. The latter is claimed to be the longest truss span in the world. There have been expended to date $1,200,000. The probable cost will be $1,500,000. The work will be finished and the bridge opened on June 1, if no trouble is encountered from high water.

Louisville, New Orleans & Texas.—The mortgage recently recorded on this road is for the purpose of securing the first-mortgage bonds of the company. These bonds are issued at the rate of $30,000 on main line and $20,000 on branches per mile, which amount covers the road, equipment and terminals. Provision is made that the road, of which 511 miles are now completed and in operation, may be increased to 800 miles; all of the subsequent issues will be at the rate of $20,000 per mile, as any additional road will be in the nature of branches; $20,550,000 is the outside limit of bonds which could be issued on the whold 800 miles.

Memphis & Charleston.—A Memphis dispatch of March 24 says that a bill in equity has been filed by several of the New York bondholders, asking for the appointment of a receiver for the road. This action is taken for the purpose of breaking the lease of the road to the East Tennessee, Virginia & Georgia Co., and in order to bring that lease before the courts.

Mexican Central.—This company reports for January, gross earnings $318,931; expenses (50.5 per cent.), $161,178; net earnings, $157,753; subsidy collected, $93,538; total income $251,291. The surplus for the month was $59,409.

Missouri Pacific.—In St. Louis, March 23, suit was begun by the city of St. Louis against this company and against R. W. Crittenden, recently appointed Receiver of the old Pacific Railroad Co., to recover $700,000 on the bonds issued by St. Louis in aid of the road in 1865, which bonds recently matured.

Nashville, Chattanooga & St. Louis.—This company's statement for February and the eight months of the fiscal year from July 1 to Feb. 28 gives the following figures:

	February.		Eight months.	
	1885.	1884.	1884-85.	1883-84.
Earnings	$174,918	$210,495	$1,573,406	$1,624,393
Expenses	105,024	119,221	899,994	880,848
Net earnings	$69,884	$91,274	$673,412	$743,545
Interest and taxes	.....	.....	456,349	442,306
Surplus	.....	.....	$217,063	$301,239

For the eight months the decrease in gross earnings was $50,987, or 3.1 per cent.; in net earnings, $70,133, or 9.4 per cent.; and in surplus, $84,176, or 27.9 per cent.

New York, Chicago & St. Louis.—On April 1 next the interest on the $4,000,000 equipment bonds falls due, and also an installment of one-tenth of the principal, making in all $540,000 to be paid on that date. On June 1 the semi-annual interest on the $15,000,000 first mortgage bonds falls due, requiring payment of $450,000. It is admitted that the earnings have been entirely insufficient to meet these payments, and a default is generally expected. The latest report is that the interest, both on the equipment and first mortgage bonds, will not be paid, and that arrangements will be at once made for the foreclosure of the mortgages and the reorganization of the company.

New York, Lake Erie & Western.—Holders of $1,000,000 of the Erie car trusts, series F. and G., have expressed themselves as not willing to accept the company's proposition of a reduced rate of interest on the bonds. About $900,000 have not been heard from, but they are believed to be averse to the proposed reduction.

New York & New England.—Of the $1,241,000 car trust certificates, about $700,000 have been deposited in trust for exchange into second-mortgage bonds, and another $100,000 is pledged to come in.

The American Loan & Trust Co., acting as trustee for the New England Car Trust Association, has sent out a notice to the effect that, unless the change heretofore recommended by the Car Trust managers, in accordance with the agreement with the New York & New England Co., is made before April 6 next, it will cause the rolling stock to be taken from the railroad and sold for the benefit of the holders of certificates. The present price of railroad rolling stock, especially second-hand, is now so low that it is feared, if a sale takes place, the amount received will pay but a very limited dividend upon the certificates. Under these circumstances it is of the utmost importance that the certificate holders signify immediately their intentions in the matter.

New York, West Shore & Buffalo.—Judge Nixon, of the United States Circuit Court at Trenton, N. J., has made an order authorizing the Receivers to issue, at a price not less than par, certificates or notes, which shall be a lien prior to the first mortgage, to an amount not to exceed $3,300,000. The limitation contained in the order of June 21, 1884, restricting the certificates for rolling stock, etc., to $400,000, and for right of way and extensions to $200,000, is removed. The Receivers are authorized to purchase such locomotives and machinery as may be necessary to properly maintain and operate the road, and to pay for the same by the certificates. The order also provides that the certificates heretofore issued by order of the court shall, until the full payment thereof, with interest, be a charge and lien, without preference or priority, on all the property covered by the first mortgage. The Receivers are also authorized to execute, subject to the approval of the court, a lease to the Union Terminal Railroad Co. of all the property proposed by the terms of the contract of Feb. 7 to be leased to that company in Buffalo.

A survey has been made for a branch line from Bowmansville, 11 miles east of Buffalo, running around the city of Buffalo to Tonawanda. This branch would be a short cut for business going to Niagara Falls and Suspension Bridge. It will probably not be built at present.

Northern Central.—This company's statement for February and the two months ending Feb. 28 is as follows:

	February.		Two months.	
	1885.	1884.	1885.	1884.
Gross earnings	$389,048.58	$398 612	$793,265	$808,458
Expenses	252,230.23	278,937	488,714	551,991
Net earnings	$136,818.35	$119,675	$304,551	$256,467

For the two months the gross earnings decreased $15,193, or 1.9 per cent., and the expenses $63,277, or 11.5 per cent.; the result being an increase of $48,084, or 18.4 per cent., in net earnings.

Northern (New Hampshire).—The charges made by some of the stockholders that there was a discrepancy between the amount received by the company for the Sullivan County road, in 1880, and the amount credited on the books is explained by the testimony of Mr. Edward Thompson, who negotiated the sale. Mr. Thompson deposes that he bought the stock which represented the property from the Northern Railroad Co. for $700,000, and afterward sold it to the Vermont Valley Co. for $800,000, pocketing the $100,000 difference as his own commission. The Northern directors had no knowledge of the price which he obtained for the road.

Old Colony.—This company has completed and will put in operation on April 1 a new branch running from Brockton, Mass., on the main line, eastward 5 miles to South Abington on the old Plymouth line. Six trains each way will be run.

Oregonian.—In the United States Circuit Court in Portland, Oregon, last week, judgment was given in favor of this company and against the Oregon Railway and Navigation Co. for $68,000, being six months' rent claimed as due under the lease, which the Oregon Railway & Navigation Co. repudiated. This decision affirms the validity of the lease. An appeal to the Supreme Court will probably be taken.

Oregon Improvement Co.—This company's statement for January and the two months of the fiscal year from Dec. 1 to Jan. 31 is as follows:

	January		Two months.	
	1885.	1884.	1884-85.	1883-84.
Earnings	$233,124	$262,177	$461,316	$533,655
Expenses	190,173	219,103	374,667	430,725
Net earnings	$42,951	$43,074	$86,649	$102,930

For the two months the earnings decreased $72,339, or 13.6 per cent., and the expenses $56,058, or 13.0 per cent., the result being a decrease of $16,281, or 15.8 per cent., in net earnings.

Pennsylvania.—The New York *Times* of March 22, says: "The collision between two freight trains, one a mixed freight, including several tank cars filled with oil, at New Brunswick, on Feb. 7, resulting in a fire that destroyed property valued at nearly $1,000,000, promises to be the basis of extensive litigation, unless the Pennsylvania Railroad Co. effects a compromise. The principal losses by the fire were sustained by the Consolidated Fruit Jar Co. and H. L. Janeway's wall-paper manufactory. On the former insurance companies held risks aggregating $252,000. The loss largely exceeded this amount, and Mr. Janeway's loss was nearly as large. The insurance companies were primarily responsible and will pay the losses. It is claimed, however, that the law of New Jersey prohibits the transportation of oil in the state over railways in mixed trains—that is, trains made up of anything besides tank cars. It is further claimed that before attempting to transport oil in such mixed trains the Pennsylvania Co. secured a bond from the Standard Oil Co. guaranteeing them against all loss resulting from such transportation.

"Representatives of the several insurance companies held a meeting and appointed a committee of four, with Mr. James R. Rankin as Chairman, to look up the facts and prepare a report. This will be submitted at a meeting to be held some time next week. A conference was called for New Brunswick last evening, when it was expected that representatives of the railway company would be present to effect a compromise. Under the law the company is responsible for the total loss, whether insured or not."

This company's statement for February shows, for all lines east of Pittsburgh and Erie, as compared with February, 1884, a decrease in gross earnings of $351,033; a decrease in expenses of $59,943; and a decrease in net earnings of $294,090. For the two months ending February 28, as compared with the corresponding period of last year, there was a decrease in gross earnings of $647,744; a decrease in expenses of $178,093, and a decrease in net earnings of $469,651.

Carrying out these comparisons, we have the following statement:

	February.		Two Months.	
	1885	1884.	1885.	1884.
Earnings	$3,077,680	$3,428,713	$6,353,202	$7,000,946
Expenses	2,247,211	2,304,154	4,532,158	4,710,251
Net earnings	$830,469	$1,124,559	$1,821,044	$2,290,695

All lines west of Pittsburgh and Erie, for the two months of 1885, show a deficiency in meeting all liabilities of $264,200, being a decrease, as compared with the same period of 1884, of $7,929.

Pensacola & Memphis.—This company has filed articles of incorporation in Alabama to build a railroad from Pensacola, Fla., northwest by way of Meridian, Miss., to Memphis, Tenn., with the object of developing the country along the line.

Philadelphia & Reading.—In Philadelphia, March 21, the Receivers presented a long petition to the court, asking authority to pay various sums of money due, or to become due under the New Jersey Central lease, including the April interest and the taxes assessed on the road in New Jersey. The petition was referred to the Master.

In the United States Circuit in Philadelphia, March 24, Judge Butler surprised counsel in the Reading cases by sending for them, and when they assembled, making quite a numerous audience, he spoke quite plainly of the necessity of bringing the Reading litigation to a termination. Ten months, he said, had elapsed since the creation of the Receivership, and yet no attempt had been made to bring the suits to an end or to secure a reorganization. He therefore notified them that the Court was considering whether or not it would in a few days enter a rule upon all parties in interest to show cause why the order of the Court appointing the Receivers of the road should not be vacated.

At a meeting of the Committee of the general mortgage bondholders the same day, it was resolved that, with a desire to meet the views of the Court, and at the same time to consider the equities of all concerned, as well as to aid them in acting intelligently on all branches of the subject, the committee will confer with representatives of such interests as may desire to advise with them.

Pittsburgh & Western.—In Pittsburgh, March 23, the Mercantile Trust Co., of New York, and others, trustees, made application to the United States Court for the appointment of receivers for this road. All parties in interest united in the application. The complaint represented that the company was insolvent, and that there are a large number of floating debt and judgment creditors seeking payment. The floating debt was stated in the application to be about $2,000,000. The Court granted the application and appointed as receivers Mr. James Callery, President of the company, and J. W. Chalfant, a large bondholder. As heretofore noted, these proceedings will probably result in a foreclosure of the mortgages and the reorganization of the company. The Receivers were directed to continue the lease of the Pittsburgh, Cleveland & Toledo and to make the necessary payments under that lease.

Pullman's Palace Car Co.—At the meeting of the stockholders of the Central Transportation Co. in Philadelphia last week, no action was taken on the proposed amendment of the lease of the Central Transportation Co.'s lines to the Pullman Co. The lease was referred to a committee of five stockholders, who are to report to an adjourned meeting.

Reading & Pottsville.—A dispatch from Pottsville, Pa., March 24, says: "The protracted and obstinate conflict between the Philadelphia & Reading and the Reading & Pottsville companies, involving the proposed route of the latter road in its approach to, and passage through, Pottsville, has been amicably adjusted. The Reading & Pottsville Co. has agreed to relinquish the Schuylkill Navigation towpath route and enter this city by a line along the side of the mountain, making all crossings of the Philadelphia & Reading track above grade. In consideration of this concession there will be no further interference with the operations of the Reading & Pottsville on the part of the Philadelphia & Reading Co. Work upon the towpath at Landingville and elsewhere has been finally discontinued, and operations upon the new route will be immediately commenced and prosecuted to the earliest possible completion."

Rome, Watertown & Ogdensburg.—An agreement has been made for the consolidation of the Oswego Railroad Bridge Co. with this company, and will be submitted to the stockholders at a special meeting, to be held April 18, in New York.

San Antonio & Aransas Pass.—This company has been reorganized and another effort is to be made to secure the money needed to build the projected line from San Antonio, Tex., to Aransas Pass on the Gulf. The company will also amend its articles of incorporation so as to provide for the extension of the road from San Antonio northwest.

Securities on the New York Stock Exchange.—The Governing Committee has placed the following securities on the lists:

Louisville & Nashville, $753,000 additional 10-40 adjustment bonds, making $2,613,000 now listed.

Northern Pacific, $1,562,000 additional general mortgage bonds, making $49,884,000 now listed.

Shenandoah Valley.—The management of this company, which has been almost identical with that of the Norfolk & Western, has been separated in some degree, Mr. Kimball having resigned the presidency of this company, and it is said that other changes are to follow.

It is generally anticipated in Philadelphia that the company will default on the April coupons on its $4,000,000 consolidated bonds. The earnings of the road have fallen off heavily during the year, and the net earnings have been insufficient to meet the interest charges. The bondholders are already making arrangements on the anticipated default and will meet shortly to appoint a committee to protect their interest.

St. Joseph & Southeastern.—This company has been organized to build a railroad from St. Joseph, Mo., southeast to Excelsior Springs, and a considerable amount has been subscribed to the stock.

Surry Lumber Co.—This company has begun work on a railroad which is to extend from Spring Grove, Va., on the James River, southward about 10 miles to the large tract of timberland which it owns in Surry County.

Texas & St. Louis.—The representatives of the bondholders have been making an inspection of this road in company with the Receiver, and it is understood that they are preparing a report in relation to the question of changing the road to standard gauge and extending it beyond the present terminus at Gatesville, Tex. The result of the inspection will not be known in some time.

Toledo, Cincinnati & St. Louis.—Last January the Court ordered the Receiver to turn over to the owners all the leased rolling stock on the road, and to make new leases for such cars and locomotives as might be needed. Before the cars could be surrendered, however, it was necessary to inspect them and make arrangements for proper repairs. This has been done, but recently representations were made to the Court that the work had not been properly done, and after hearing arguments the Judge intimated that he would probably set aside all the reports in the case and go back to the original order.

Union Pacific.—At the annual meeting in Boston, March 25, votes were adopted by the meeting approving of the investments made during the past year, and the acts of the board of directors for the same period. Mr. Adams, in reply to a request for certain information regarding the investments for the year, said these transactions were many of them of a nominal character, which represented all transactions in the nature of acquiring property and securing auxiliaries or branch lines of the company which had taken place during the year, and are very largely book transactions in the closing up of these accounts, as they will appear in great detail in the full report, to which questions were referred.

Wabash, St. Louis & Pacific.—The United States Circuit Court at St. Louis issued an order, March 19, under which all the Wabash Railroad cases are consolidated, under the title of the Central Trust Co. *et al.* against the Wabash, St. Louis & Pacific Railway Co. and others. This takes the jurisdiction in the cases from the state courts.

The trustees under the Toledo, Peoria & Western preferred mortgage have begun a suit to foreclose the mortgage in the United States Circuit Court, in Keokuk, Ia. They are acting under instructions from the bondholders.

The Trustees under the first mortgage, on the Havana, Rantoul & Eastern road, now a part of the Wabash, have applied to the Court for leave to foreclose their mortgage.

It is stated that at the April term the receivers will apply to the court for authority to cancel the leases of no less than 22 branches which have proved unprofitable.

Westport & Redding.—This company has filed articles of incorporation to build a railroad from Westport, Conn., on the New York, New Haven & Hartford road, northward to Redding, about 16 miles. The capital stock is $500,000. Mr. John S. King, of New York, and Miller Ketcham, of Westport, are the chief promoters of the project.

Winona, Alma & Northern.—Work on the grading of this road, which has been going on slowly for some time past, has been suspended altogether. The officers of the company say that this has been done in consequence of pending negotiations for a transfer of the property.